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Editorial

The Fountain journal of interdisciplinary studies is a peer-reviewed academic journal dedicated to advancing ongoing research that addresses the complex themes facing our world today. While the journal has a global outlook, regional and Zimbabwean challenges have taken center stage in this Volume which has three articles on climate change, related to the optimization of carbon sequestration, biodiversity conservation and livelihood benefits in rural communities; climate justice, equity adaptation and sustainability; and leadership as a critical cog in climate change and adaptation. The role of education in nation building is addressed in three articles that focus on learner centric blended learning in physical education: ethical considerations in AI driven education systems and the critical role of spiritual accompaniment for a holistic education amongst tertiary students. An article on the resilience of traditional pottery that serves practical as well as symbolic and religious purposes features changing usages imbued with new meanings of aesthetic, religious and commercial value.

On climate change, there is a strong perception that the more than 60% of Zimbabwe's population that lives in rural areas is marginalised from mainstream economic activity and therefore poorer. Often these communities live on abundant untaped natural resources which are extracted for consumption and profit elsewhere. As a mitigation measure therefore, partnering social businesses with community-managed forests can significantly advance social developmental goals related to climate change, health, a clean environment, and economic growth. The paper by Muzurura specifically explores how social businesses can enhance carbon sequestration and biodiversity conservation, fostering sustainable livelihoods for marginalized communities. In this way, climate justice, equity, adaption and sustainability can be attained. Zimbabwe's limited financial resources, economic instability, and heavy reliance on rain-fed agriculture render the country highly susceptible to the impacts of climate change. Governance and accountability deficits, as well as shortcomings in decision-making processes, are exacerbating factors according to Matsiko and Magaraba. Critically, although research has shown leadership as significant in mitigation and adaptation to climate change, effective leadership continues to be elusive in Africa in general. There is need for transformational leaders who will advocate for substantial change in

existing institutional and societal values to effect ecological sustainability, according to Nemashakwe.

On education, the Covid-19 global experience challenged established educational practices by bringing to the fore the possibility of real time distance education in just about all fields of learning. The concept of blended learning that is learner centric emerged, even in physical education. However, in the case of Zimbabwe, assessment of blended learning suffers deficiencies in tertiary Physical Education due to financial and resource scarcities. Technologically mediated expertise and learner-oriented approaches remain a challenge hence learners' critical superglue dimensions to athletic development are compromised. Furthermore, while the application of artificial intelligence (AI) in university education systems is accelerating globally, it is raising urgent ethical concerns about infringements on students' digital rights. Key AI applications like adaptive learning platforms, automated essay grading, and student monitoring systems and the extensive data collection and algorithmic decision-making enabled by these technologies, could undermine student rights to privacy and freedom of thought. Regulatory approaches to AI ethics in higher education diverge worldwide. While the EU has privacy and transparency laws, the US lacks comprehensive protections. Zimbabwe and many developing nations have minimal AI oversight, thereby enabling unrestrained experimentation on campuses, according to Revesai. Finaly, if the student is the centre of the education system, attention to the holistic development of students becomes essential, especially in the face of the complex behavioural challenges that are emerging in higher education contexts. There are many models for this, but one of them is spiritual accompaniment. Findings by Zishiri and Marambanyika suggest that spiritual accompaniment is increasingly becoming a necessary cog in fostering holistic development in tertiary students in Zimbabwe.

Regarding traditional pottery, while there has not been a major change in the form and shapes of the vessels moulded, there has been a significant shift in the end use of the vessels to include tourist souvenirs and symbolic prayer accessories. To a greater extent, the commercialised symbolic function has motivated the continuing manufacture of pottery vessels in Zimbabwe.

By the Editor, A S Marizane

Optimising Carbon Sequestration, Biodiversity Conservation and Livelihood Benefits in Munanaire Community-managed Native Forest: The Potential Role of Social Businesses in Zimbabwe.

Joe Muzurura

Abstract

The interconnected risks of biodiversity loss, declining carbon stores in community-managed native forests, and rapid climate changes have heightened awareness in many developing countries of the urgent need to conserve indigenous forests. Beyond their timber value, native forests provide crucial non-timber benefits, including effective carbon sequestration, support for higher biodiversity, and food security. Partnering social businesses with community-managed forests can significantly advance social development goals related to climate change, health, a clean environment, and economic growth. This paper explores how social businesses can enhance carbon sequestration and biodiversity conservation, fostering sustainable livelihoods for marginalized communities. Qualitative data was gathered through structured focus group discussions with participants selected via purposive sampling. Our findings indicate that social businesses can optimize carbon sequestration in community-managed forests by providing modern management skills and facilitating access to green financing instruments like carbon credits and green bonds. Focusing on the non-timber benefits of indigenous trees can help forest-based communities diversify income streams, enhance livelihood resilience, and promote adaptability to climate change. This study contributes to understanding how to improve the resilience of marginalized communities dependent on indigenous forests.

Keywords: Carbon Sequestration, Biodiversity, Community-managed forests, Social Businesses, Zimbabwe

1.0 Introduction and Background

In many developing economies, social businesses' support for community-managed native also known as indigenous forests has become a major tributary not only for attaining sustainable livelihoods but improving resilience of marginalised communities

against the negative effects of climate change. Whilst there is no universally accepted definition of social businesses/enterprises, however, according to Yunus (2010), social businesses are more beneficial than mere charitable organisations in that they do not encourage dependency among the served but put those that are being served in a position of being active participants in the economy. Social businesses address a broad range of social and environmental problems including unemployment, social exclusion, deforestation, global warming, inequalities in accessing education, health, social among other basic services. For the purposes of this paper, social businesses refer to hybrid organisations that have both social and commercial mandates, particularly trying to solve the triple hybrid of social, financial and environmental goals. Most rural people living in Zimbabwe directly subsist from indigenous forest biodiversity and thus coupling social businesses in biodiversity conservation could be a more ingenious strategy for dealing with abject poverty, food insecurity and employment creation in marginalised communities. This is because apart for their timber extraction value, native forests provide a crucial linkage in the traditional food security value-chain system through the provision of important non-timber benefits. Many native trees aside from their timber value also come with ancillary co-benefits such as providing clean air and water (Chazdon and Brancalion, 2019; Dolch et al., 2016; de Almeida et al., 2020; Hu et al., 2020), help to control soil erosion (Estrada-Villegas et al., 2019; Annos et al., 2019; Cuenca et al., 2018), offer recreational and aesthetic amenities including traditional medicine (Joo and Suh, 2017; De Vitis et al., 2020; Crouzeilles et al., 2020), improve livelihoods by contributing to food security (Steur et al., 2020; Liu et al., 2020). In addition, most native forests in Zimbabwe have wilderness existence value that appeals to tourists seeking spiritual healing or interested in bird watching, hunting and forest-based cultural experiences (Muzurura et al., 2023; Muzurura et al., 2022). More importantly, many studies also show a positive correlation among sustainable-community managed forests, economic growth and national development (Asbeck et al., 2021; Bhardwaj et al., 2021; Tolangay and Moktan, 2020; Oldekop et al., 2019; Wyse and Dickie, 2018). Fagan et al., 2020; Deere et al., 2020; Dvderski and Jagodzinski, 2020).

Importantly, many studies report that most native forests efficiently store more long-lived stock and flow of carbon pollutants than exotic plantations, and hence have the potential to offer substantial amount of climate change and global warming mitigation

(Asbeck et al., 2021; Bhardwaj et al., 2021; Wyse and Dickie, 2018; Hu et al., 2020). Like many developing economies in Sub-Saharan Africa, Zimbabwe has not been excepted from the adverse impacts of climate change and global warming such as; lengthening of crop growing seasons, early tree flowering (Asbeck et al., 2021; Bhardwaj et al., 2021), reduced clean water availability and/or exposure to extreme overlapping flooding and droughts (de Almeida et al., 2020; Hu et al., 2020), reduction in the quality of crop and fruit yields (Kaushal and Baishya, 2021; Hong et al., 2020; Hohl et al., 2020), and sudden upsurges in the population of rural people exposed to vector-borne diseases like malaria and cholera (Schleussner et al., 2016; Huang et al., 2020; Hu et al., 2020).

In recent years, many community-managed native forests in Zimbabwe have been increasingly subjected to severe anthropogenetic interference leading to lower carbon sink and loss of biodiversity. For instance, rapid urbanisation has forced the country to switch land use from indigenous forests to either residential, industrial uses or agricultural use. Consequently, the harmful effects of extreme climate changes associated with rapid deforestation of community-managed native forests have often fallen disproportionately on marginalised communities, especially women and children. Muzurura (2019) reports that unlike men, women and children have a constrained adaptive capacity to deal with the effects of climate change. If social businesses are properly harnessed as creators of environmental social value, they could play an integral role in assisting the preservation of community-managed indigenous forests and directly contribute towards sustainable climate and global warming mitigation strategies for developing countries like Zimbabwe.

At international level, Zimbabwe is a signatory to various multilateral agreements that include the Kyoto Protocol, the Paris Agreement, the Montreal Protocol, United Nations Conventions to Combat Desertification, United Nations Convention on Biological Diversity, and the Convention on the International Trade on Endangered Species of wild flora and fauna. Of noteworthy, in 1992, Zimbabwe became one of the first countries to ratify the United Nations Framework Convention on Climate Change (UNFCCC) whose main objective is stabilising greenhouse gas emission

concentrations to a level that would prevent anthropogenic interference with the climatic system, within a time period which allows ecosystems to adapt naturally and enable sustainable development in the atmosphere. At the national level, in 2019 Zimbabwe formulated the National Climate Policy that is intended to influence the adoption of agroecology as an adaptation and mitigation remedy to the effects of climate change and global warming. Despite being party to many international and regional bodies that deal with deforestation, climate change and global warming, the country has failed to situate social businesses in national climate mitigation strategies, practices and policies. In fact, both social businesses and community managed indigenous forests have also been overlooked or ignored by the country's natural environment conservation policies. The country's national conservation policy for instance, favours commercial forest enterprises that are primarily driven by profit maximisation at the expense of social value. As a result, large swathe of what were community-managed forests have been re-forested with fast growing exotic forests. However, as reported in many studies native forests tend to sustain higher species diversity and sequester more carbon than exotic plantations (Das et al., 2021; Mattana et al., 2020; Friggens et al., 2020; Crouzeillej et al., 2016; Kaushal and Baishya, 2021; Dar et al., 2019; Hoque et al., 2020).

A total of 40% of Zimbabwe's land is occupied by forests; of which 15,624,000 hectares of the forests are native trees whilst 153,000 hectares are covered by plantations (Food and Agricultural Organisation (FAO), 2020; Government of Zimbabwe (GoZ), 2023). At least 5.1% or about 801,000 hectares is categorised as primary forest that is, being the most biodiverse and carbon-dense form of native forests. The most common native trees in Munanaire forests include the dry miombo woodlands, the Baikiaea plurijuga, the acacia and colophospermum mopane and combretum-terminalia (GoZ, 2022). Even more worrying, whilst most indigenous trees in Munanaire forest have a huge potential for sinking more carbon due to extensive biodiversity, they have poor regeneration rates. Anthropogenic activities that are common in this forest include overexploitation, unplanned deforestation and in some sections, changes in land use from forestry to agricultural and artisanal mining activities. Whilst most exotic trees take shorter periods to mature, most native trees in Munanaire forest mature at around 50 to 100 years (GoZ, 2020).

The problem of deforestation is not intrinsic to Munanaire forest only. For instance, between 1990 and 2020, the country lost over 33,000 hectares or 60,000,000 million native trees annually (GoZ, 2022). Out of the total 15.62 million hectares, forest cover is expected to decrease to 6.189 million hectares by 2030 based on an average deforestation rate of 312,000 hectares by annum (GoZ, 2022). Most of the indigenous forests are lost to manufacturing by large firms, wildfires, household uses like energy supply and food, brickmaking and wood carving. An estimated 0.6% of Zimbabwe's native forests are also lost to agricultural expansion particularly to tobacco curing and production of charcoal (GoZ). In 2022 only, the country could have lost an estimated 9,050,000 hectares of indigenous forests and an equivalent of 3,82 metric tonnes of CO_2 emission (FAO, 2022). Furthermore, at least 10% of colophospermum mopane woodlands that are renowned for higher biomass are damaged during the harvesting of Mopane worms (Gonimbrasia belina), and expansion of land to support mining activities. The GoZ (2020) estimates that the country requires at least US$55 billion to reduce greenhouse emissions by 33%. This amount is huge given that the country is also saddled with a high public debt overhang of US$18.8 billion, and that its gross domestic debt growth rate has been mainly phlegmatic for the past two decades.

According to Shirima et al (2011), Zimbabwe native woodlands store an estimated 23 Mg ha-1, hence, making them a significant carbon sink and a main tributary to climate change mitigation strategy. An increase in carbon sink increases the availability of freshwater (Tolangay and Moktan, 2020; Hoque et al., 2021; Das et al., 2021), causes huge latitudinal and elevated shift of biomes (Asbeck et al., 2021; Crane, 2020; Estrada-Villegas et al., 2019), which in turn increases food insecurity in developing countries (Schleussner et al., 2016; Huang et al., 2020; Hu et al., 2020; Kohl et al., 2020; Maxwell et al., 2019). Hence, the importance of coming up with strategies that optimise carbon sequestration in these woodlands to mitigate the effects of greenhouse emissions and food insecurity. Low optimisation of carbon sequestration and loss of biodiversity in community-managed native trees as Zimbabwe's Munanaire forest could be exacerbating climatic changes and global warming in surrounding districts and thus, compromising the sustainability of local communities' livelihoods through reduced food security and elevated natural disasters. Carbon sequestration affects carbon and nitrogen cycles that are key to the mitigation of climatic changes

and global warming (Annos et al., 2019; Estrada-Villegas et al., 2019; Cuenca et al., 2018; Fofana et al., 2020; Hohl et al., 2020). In recent years, the country has been exposed to severe and erratic weather patterns characterised by intermittent cyclical droughts and shifting onset of rainy seasons. Extreme weather patterns, especially cyclones and El Niño effects have increased their frequency, duration and intensity. Such climatic changes may be linked to global warming and have potential to disrupt livelihoods by aggravating food insecurity in both rural and urban areas. The main objective of the paper was to explore how Zimbabwe can yoke social businesses and marginalised communities in order to enhance carbon sink and biodiversity conservation as a strategy for improving rural people's welfare.

The study is important for several reasons. First, natural climate solutions and strategies especially those that rope in social businesses may be a more sustainable way of promoting biodiversity conservation and reforestation of community-managed forests. Second, native trees produce large biomasses that have many social value benefits such as increasing ecosystem structure, improving biodiversity conservation, strengthening wildlife protection, enhancing water catchment, preventing soil erosion and soil moisture holding capacity. Simultaneously applying ecological and social concepts also known as agroecology in the design and management of sustainable agriculture and food systems may help rural communities to arrest hunger and poverty. Third, there is an upsurge in the use of carbon financing instruments such as carbon credits and green bonds in many developed economies (Erbough and Oldekop, 2018; Hell and Brancalion, 2020; Gann et al., 2019; Crane, 2020; Liu et al., 2020). For instance, social businesses and forest-based communities may use community-managed forests to offset the huge portions of carbon emissions in developed economies using carbon credits and green financing.

Fourth, in many developing countries such as Zimbabwe, the interconnected threats of loss of biodiversity through deforestation of native trees, climate change and poverty reduction have increased awareness on the necessity to conserve indigenous forests. However, in Zimbabwe there is a lacuna of empirical literature that focus on the complex linkage among social businesses, community-managed indigenous forests, biodiversity conservation and food security. Hence, the purpose of this study. The rest

of the study is organised as follows. The first section covers the introduction and background. Literature review is presented in section two. The third section covers the methodology whilst the fourth and fifth sections present research findings, discussions and policy implications respectively.

2.0 Literature Review

Carbon sequestration is a complex issue covering various issues in the biophysical environment (Mattana et al., 2020). The term carbon sequestration is often used to describe the acquisition and storage of carbon to reduce the impact of carbon emissions in the atmosphere (FAO, 2020; Das et al., 2021; Asbeck et al., 2021). When compared to pasture systems or single-species crops, forest systems are reported to have a higher potential to sequester more carbon (FAO, 2020; Kaushal and Baishya, 2021) Hong et al., 2020, Hohl et al., 2020; Deere et al., 2020). This is because forest systems capture and utilise light, nutrients and water more efficiently than pastures (Diaz et al., 2016; Bloomfield et al., 2019; Erinos et al., 2019). Mature indigenous trees are major long-term carbon stores due to their complex structure, hardwood nature of trees and stronger resilience to flooding, droughts and wild fires (Seddon et al, 2019; NevenKamp et al., 2019; Maxwell, 2018). In indigenous forests, carbon sequestration can also be combined with soil-based remedies to prevent carbon emissions and remove atmospheric carbon dioxide (Das et al., 2018; Chu et al., 2017; Joo and Suh, 2017; De Vitis et al., 2020; Crouzeilles et al., 2020) and the public sector (Chu et al., 2017; Joo & Suh, 2017). Trees help to conserve soil, water quality and provide recreation (Korner, 2017; Lewis et al., 2019; Molin et al., 2019; Noomau et al., 2018). Trees provide people with invaluable products and services such as food, medicine, building materials (Brancalion and Holl, 2020; Diaz et al., 2016; Cuenca et al., 2018; Bannister et al., 2016; Korner, 2017), fibre, recreation space, seed dispersers and pollution filtration (Chaisdon and Uriate, 2016; Chomba et al., 2016; Molin et al., 2019), reduce flood risks (de Souza et al., 2016; Fagan et al., 2020; Hu et al., 2020) are important reservoirs of carbon (Bond et al., 2019; Boissiere et al., 2017; Bellard et al., 2016), water and nutrients (Douwes and Buthelezi, 2016; Feng et al., 2016; Das et al., 2018). Displacement of native forests have unintended consequences particularly, the reduction of pollination services (Hong et al., 2020; Heilmayr et al., 2020; Brancalion

et al., 2018), disruption of water cycles and decrease in carbon stored in above ground biomass (Reid et al., 2019; Perion et al., 2019), lowering of albedo in boreal zones and inducing temperature rises (Kull et al., 2019 Besseau et al., 2018; Rozendaal et al., 2019; Fagun et al., 2020).

According to Kildisheva et al (2020), extensive use of exotic monoculture plantations instead of promoting diverse and carbon rich-mix of community-managed indigenous forests have serious implications on food security and sustainability. The reason being that monoculture plantations discourage optimum carbon sequestration due to early harvesting (Hu et al., 2020; Crane, 2020; Hu et al., 2020), decelerate biodiversity growth and recovery (Philpson et al., 2020; Parsa et al., 2019; Gardan et al., 2020), and may hinder sustainable communal livelihoods through lower non-timber and social value (Heilmayr et al., 2020; Brancalion et al., 2020; Pedrini et al., 2020; Kildisheva et al., 2020; Fofana et al., 2020). Unlike commercial forest business, social businesses are largely motivated by ethical issues, governance and environment and hence, suitable culverts for protecting natural environment (Garden et al., 2020; Liu et al., 2020). Indeed, many studies also demonstrate that the loss of indigenous forests are not easily compensated by reforestation using exotic trees in spite of short growing season (Oldekop et al., 2019; Pedrini et al., 2020; Seddon et al., 2019; Ennos et al., 2019; Veldman et al., 2019; Wyse and Dickie, 2018).

In many countries social business and what are termed community forest enterprises have been promoted as means by which to deliver social, environmental, and financial benefits to forest-based communities (Hajjar et al., 2020). However, their major shortcoming is that in pursuit of profit maximisation goals, the need to protect the natural environment is seriously compromised. In contrast, social businesses go beyond by helping local communities to address problems of poverty, deforestation, social marginalisation and environmental degradation given the inability of central governments and traditional commercial businesses to do so (Perino et al., 2019). However, the contribution of social businesses could be meaningful if the enabling environmental laws and policies provide incentives for sound forest management, support increased value addition and promote the formation of human, physical, social

and financial capital for sustainable production of timber and non-timber forest products (Frigesens et al., 2020; Perino et al., 2019; Mollin et al. 2018)

3.0 Methodology

The extant study used a revelatory case study of Munanaire community-managed native forest located in the Guruve District of Zimbabwe. The researcher conducted one focus group discussion. The advantage of using a focus group discussion within a single case was that researcher was able to study the ways in which various individuals collectively made sense about the benefits of community-managed forests. As shown in Table 1, the composition of the focus group was stratified according to forest management knowledge and responsibilities, local social businesses, expertise and specialised forest skills, and being a local resident. The focus group had four objectives. The first objective was to solicit perspectives about how to better manage community managed native forests for the benefit of local communities. Second, to explore strategies that can be used to optimise carbon sequestration and biodiversity conservation in community-managed native forests in order to promote sustainable livelihoods. Third, to explore whether it was feasible to reforest some depleted areas of indigenous forests with exotic forests. Fourth, to examine how social business can help community-managed forests to improve biodiversity conservations, carbon sequestration and livelihood resilience.

The focus group discussion was also held under the assumption that the community experiences would be different in particularly local environment and socio-economic contexts. Whilst it is accepted that focus group discussions cannot aim to be truly representative of the total population living in the three wards, the researcher ensured the results could be deemed illustrative of the possible ward variation and therefore, able to provide a limited generalisability. In this regard, the participants for the focus group discussions were chosen using purposive sampling techniques. Participants were selected using criteria like; knowledgeable about environmental conservation of indigenous trees, direct beneficiaries of these forest, managers of local social businesses, being botanists, ecologists or environmental economists. Although a discussion script was employed, the researcher developed a relatively unstructured

approach to asking questions that was in keeping with the broad nature of the study under consideration. The discussion used a combination of vernacular languages and English, and notes were taken by the researcher who later converted the notes into a codebook summarising the main topics discussed and participant's views.

Table1: Location and Attendees of focus group discussions

Name of ward	Number of attendees	Reason for selection
Ward 21	5	beneficiaries
Ward 22	5	beneficiaries
Ward 23	5	Headman, beneficiaries
Key experts	8	2 Botanical experts; 2x ecologists, 3x environmentalists, 1x economist

4.0 Discussions and Findings

4.1 The role of social business in community managed forests

It was found that social businesses can play a significant role in fostering socio-economic development in communities that depend on indigenous forests. Most beneficiaries suggested that social businesses can assist in providing the essential expertise, forest management skills, reforestation strategies, and how to mobilise revenues using carbon credits. This suggestion was of particular interest as it was very clear from the group discussions that most local people involved with the management of Munanaire forest were not even aware of how carbon credits and green bonds could assist these communities to derive and diversify their sources of revenue. This was after it was reported that Munanaire forest was largely used for its direct timber value and non-timber benefits such as a source of fuel, fibre, and traditional medicine, food, and rainmaking activities. A biologist indicated that Munanaire forest was useful in providing watershed protection, soil erosion control, recreational, educational, cultural and spiritual benefits. It was also demonstrated by two ecologists that carbon sequestration in Munanaire forest is potentially 50 times greater than in monoculture

plantations. This finding is also supported by a number of studies for example, Lewis et al (2019) and Molin et al (2018).

4.2 Reforestation of depleted areas of Munanaire forest

Regarding reforesting some sections of depleted indigenous forests in Munanaire forests, most participants such as ecologists, environmentalists and economists were all in agreement that reforestation of former community-managed forests with either indigenous trees or some monoculture small plantation can help rural communities to achieve multiple goals like mitigation of climate change, biodiversity conservation, economic growth and national development. It was added by some beneficiaries of Munanaire community managed forests that rather than being an end goal in itself, situating some of form of monoculture plantation within community-managed forests could also serve manifold objectives like climate-change mitigation, soil and hydrological stability as well as providing socio-economic benefits like food security, resilience to drought and floods, and creating employment for youth and women. These findings have confirmation in literature where it is reported that compared to exotic forests native forests support high species and functional trait diversity that enhance ecosystem resilience and improve forest productivity (Kull et al., 2019 Besseau et al., 2018; Rozendaal et al., 2019; Fagun et al., 2020; Philpson et al., 2020; Dvderski and Jagodzinski, 2020). However, some beneficiaries preferred reforestation with native or exotic trees. For instance, two participants were in favour of reforestation using exotic trees for reasons that these trees mature early and have a high revenue turnover compared with native forests. This view nevertheless is not supported by some studies that suggest that decisions to reforest parts of native trees with exotic ones must be based on considering a combination of ecological, historical, cultural and socio-economic factors at different spatial scales. This view has support in literature (se Friggens et al., 2020; Dass et al., 2018; Crane, 2020; Lewis et al., 2019); Chazdon and Brancalion, 2019).

4.3 On optimising carbon sequestration and biodiversity conservation

One botanist argued that whilst monocultures of fast-growing plantations are used in other countries, in the long-term indigenous forests maximise biomass and sink far more carbon while conserving resilient biodiversity. It was also suggested by the local headmen that from traditional experiences the Munanaire native forest has inadequate seed supply that are also difficult to store due to their desiccation sensitivity. However, a serious concern raised by many beneficiaries was that some exotic species have the potential of becoming invasive and thus may have disastrous effects on strategies to improve natural habitat, land degradation, and may lead to sub-optimisation of carbon stores in Munanaire forests. As also observed by Bellard et al (2016) invasive species are the major source of global biodiversity and lower carbon sequestration in many native forests. This finding is not wholly supported by literature. For example, several studies demonstrate that mixing forest species instead of a monoculture plantation has a higher capacity to conserve biodiversity, and attract seed pollinators and dispersers (Dyderski and Jagodzinski, 2020; Crouzeilles et al., 2020; Holl and Brancalion, 2020; Horak et al. 2019). Horak et al (2019) aver that if patches of exotic forests are maintained within a plantation of native forests, such forests will not only regenerate autonomously but will become more resilient to fire, diseases and extreme droughts.

5.0 Recommendations

Despite their significant contribution to carbon sink and biodiversity, most indigenous trees take time to mature and are difficult to reforest; therefore, the study recommends promoting some naturalist interactions that involve reforesting depleted portions of indigenous tree species with some monoculture plantations and introduce some seed-dispersing animals, fungi and pollinators to achieve a resilient and biodiverse ecosystem in community-managed forests. In this regard, social businesses can assist communities that subsist on indigenous forests to mobilise funding for some of these initiatives. Social businesses are also recommended to scale up non-timber value activities in community-managed indigenous forests such as bee-keeping, rearing of wild animals, growing of wild mushrooms, handcrafting and other

agroecological activities. These activities reduce the demand for the timber value of indigenous trees whilst simultaneously arresting deforestation.

Developing sustainable and diverse income streams for forest-dependent communities

For community-managed native forests to be sustainable, the income streams generated by the forest must exceed those obtained from both timber and non-timber value. Hence, social businesses can assist native forest-dependent communities through developing sustainable income streams. The findings show that communities that manage Munanaire forests are not aware of carbon credits and other forms of green financing. Therefore, the recommendation for social businesses is to assist these communities to broaden revenue streams through promoting cultural and ecotourism, providing marketable watershed services, and facilitating the access to carbon credits and green financing in international markets. Social businesses should also help to create a missing market for non-timber forest products such as fruits, fungi, mushrooms, nuts, fibres, ornamental and medicinal plants, mosses, resins, gums, syrup, game meat, and honey. These in turn can help to increase livelihood resilience of the forest-based communities against food insecurity, poverty and unemployment.

Replanting depleted areas with seedlings with appropriate genetic variability and provenance

Large sections of the community-managed Munanaire forests have been lost to anthropogenic activities mainly for fuel-wood, agricultural and residential expansion. In this regard, social business can help by providing locals with knowledge of vegetative propagation and by providing seeds with higher genetic diversity consistent with local genetic variation. This may help to regenerate indigenous trees that are resilient to diseases, inbreeding depression and the effects of flooding and wildfires. Training local people on phenological monitoring regarding abiotic and biotic factors as well as seed physiology and morphology can help faster afforestation of depleted areas. Social businesses may help to provide linkages with commercial forest

enterprises as well as experts like botanists and ecologists to enable locals to build low-cost seed-storage facilities and seed banks for use in times of need. This is because most indigenous seeds in Munanaire forests have dormancy mechanisms that may require specific conditions for germination. Traditional knowledge of locals who have resided and benefited from community-managed forests should be harnessed for training of younger generations.

Green financing and Carbon Credits

The value of carbon often exceeds revenues from the main drivers of deforestation in community-managed forests such as timber value. Therefore, monetising community managed forests as carbon sinks by ensuring local communities have direct markets to carbon markets. Social businesses can also provide low-interest start-up loans to enable community managed forests to be transformed into viable forest commercial enterprises. In addition, social business may also provide cheap loans to local communities to assist in security and adaptation during periods of financial hardship that are often induced by unplanned destruction of forests either by wild fires or floods. Whilst harvesting rates of returns of monoculture plantations are reasonably high compared to indigenous forests, social businesses must help to smoothen variabilities of market prices of fuelwood by helping to regulate foreign product market prices.

Innovative marketing skills

Most local people are not aware or are unfamiliar with marketing of ecotourism and other services that help to directly monetise biodiversity, substantial start-up funding must be provided by social businesses especially for accommodation construction near community managed forests. Social business can help by monitoring that payments actually benefit local communities responsible for the native forests so as to dis-incentivise any prospects of changes in land use to other activities such as agriculture or artisanal mining. Promoting partnerships that encompass multiple stakeholders such as government, forest scientists, chiefs, community leaders and social businesses are likely to lead to enduring long-term benefits for local communities that depend on Munanaire forests. In turn, optimising carbon

sequestration in community managed forests may require overcoming social-economic-political and cultural barriers as well as good governance of natural resources. The government must reduce the regulatory burdens on forest-based communities by addressing land tenure concerns and carbon fixation, watershed protection, facilitating export promotion, and simplifying bureaucratic requirements on the processing of foreign products, especially game meat. Other promising options are green and social purchasing policies (buying forest products that originate from environmentally friendly and/or socially responsible SMFEs). In this regard strategic alliances with social businesses, downstream buyers and processors can increase returns of community-managed forests through risk/benefit sharing mechanisms and by reducing transaction costs. Such alliances can also promote value-addition opportunities and access to market information for local communities.

6.0 Conclusions

In many developing economies, social businesses' support for community-managed native forests have become crucial for biodiversity conservation, optimising and maintaining carbon sinks, and thus helping the resilience of marginalised communities that subsist on indigenous trees. The main purpose of the study was to examine how social business can help biodiversity conservation, carbon sequestration and improved livelihoods in community-managed native trees. The main findings demonstrate that if properly yoked with community-managed forests, social business can help to diversify incomes coming from non-timber products.

References

Abram, N. K., MacMillan, D. C., Xofis, P., Ancrenaz, M., Tzanopoulos, J., Ong, R., Goossens, B., Koh, L. P., Del Valle, C., Peter, L., Morel, A. C., Lackman, I., Chung, R., Kler, H., Ambu, L., Baya, W., & Knight, A. T. (2016). Identifying where REDD+ financially out-competes oil palm in floodplain landscapes using a fine-scale approach. *PLoS One 11*(6), 1–23.

Arroyo-Rodríguez, V., Melo, F. P. L., Martínez-Ramos, M., Bongers, F., Chazdon, R. L., Meave, J. A., Norden, N., Santos, B. A., Leal, I. R., & Tabarelli, M. (2017). Multiple successional pathways in human-modified tropical landscapes: new insights from forest succession, forest fragmentation and landscape ecology research. *Biological Reviews*, *92*(1): 326–340.

Asbeck, T., Sabatini, F., Augustynczik, A. L., Basile, M., Helbach, J., Jonker, M., Knuff, A., & Bauhus, J. (2021). Biodiversity response to forest management intensity, carbon stocks and net primary production in temperate montane forests. *Scientific Reports*, *11*(1):1–11.

Asmelash, F., Bekele, T., & Birhane, E. (2016). The potential role of arbuscular mycorrhizal fungi in the restoration of degraded lands. *Frontiers in Microbiology*, 7, 1–15.

Baiyegunhi L, Oppong B, Senyolo G. (2016) Mopane worm (Imbrasia belina) and rural household food security in Limpopo province, *South Africa. Food Security, 8(*1):153–65.

Bannister, J. R., Vargas-Gaete, R., Ovalle, J. F., Acevedo, M., Fuentes-Ramirez, A., Donoso, P. J., Promis, A., & Smith-Ramírez, C. (2018). Major bottlenecks for the restoration of natural forests in Chile. *Restoration Ecology*, *26*(6): 1039–1044.

Bellard, C., Cassey, P., & Blackburn, T. M. (2016). Alien species as a driver of recent extinctions. *Biology Letters*, *12*(4): 14-35

Bhardwaj, D. R., Tahiry, H., Sharma, P., Pala, N. A., Kumar, D., Kumar, A., & Bharti, B. (2021). Influence of aspect and Elevational gradient on vegetation pattern,

tree characteristics and ecosystem carbon density in northwestern Himalayas. *Land*, *10*(11), 1109.

Bloomfield, G., Meli, P., Brancalion, P. H. S., Terris, E., Guariguata, M. R., & Garen, E. (2019). Strategic insights for capacity development on forest landscape restoration: Implications for addressing global commitments. *Tropical Conservation Science*, *12* (1):12-32

Boissière, M., Herold, M., Atmadja, S., & Sheil, D. (2017). The feasibility of local participation in Measuring, Reporting and Verification (PMRV) for REDD+. *PLoS One*, *12*(5): 1–9.

Bond, W. J., Stevens, N., Midgley, G. F., & Lehmann, C. E. R. (2019). The trouble with trees: Afforestation plans for Africa. *Trends in Ecology & Evolution*, 34(11): 963–965

Brancalion, P. H. S., & Chazdon, R. L. (2017). Beyond hectares: Four principles to guide reforestation in the context of tropical forest and landscape restoration. *Restoration Ecology*, *25*(4): 491–496.

Brancalion, P. H. S., & Holl, K. D. (2020). Guidance for successful tree planting initiatives. *Journal of Applied Ecology*, 205(4969), 2349–2361.

Brancalion, P. H. S., Amazonas, N. T., Chazdon, R. L., van Melis, J., Rodrigues, R. R., Silva, C. C., Sorrini, T. B., & Holl, K. D. (2020). Exotic eucalypts: From demonized trees to allies of tropical forest restoration? *Journal of Applied Ecology*, *57*(1): 55–66.

Brancalion, P. H. S., Bello, C., Chazdon, R. L., Galetti, M., Jordano, P., Lima, R. A. F., Medina, A., Pizo, M. A., & Reid, J. L. (2018). Maximizing biodiversity conservation and carbon stocking in restored tropical forests. *Conservation Letters*, *11*(4): 1–9.

Brancalion, P. H. S., Lamb, D., Ceccon, E., Boucher, D., Herbohn, J., Strassburg, B., & Edwards, D. P. (2017). Using markets to leverage investment in forest and landscape restoration in the tropics. *Forest Policy and Economics*, 85, 103–113.

Burrascano, S., Chytrý, M., Kuemmerle, T., Giarrizzo, E., Luyssaert, S., Sabatini, F. M., & Blasi, C. (2016). Current European policies are unlikely to jointly foster carbon sequestration and protect biodiversity. *Biological Conservation*, 201, 370–376.

Burton, V., Moseley, D., Brown, C., Metzger, M. J., & Bellamy, P. (2018). Reviewing the evidence base for the effects of woodland expansion on biodiversity and ecosystem services in the United Kingdom. *Forest Ecology and Management*, 430, 366–379.

Catterall, C. P. (2016). Roles of non-native species in large-scale regeneration of moist tropical forests on anthropogenic grassland. *Biotropica*, *48*(6): 809–824.

Chazdon, R. L., & Uriarte, M. (2016). Natural regeneration in the context of large-scale forest and landscape restoration in the tropics. *Biotropica*, *48*(6): 709–715.

Chazdon, R., & Brancalion, P. (2019). Restoring forests as a means to many ends. An urgent need to replenish tree canopy cover calls for holistic approaches. *Science*, 365:6448.

Chomba, S., Kariuki, J., Friis Lund, J., & Sinclair, F. (2016). Roots of inequity: How the implementation of REDD+ reinforces past injustices. *Land Use Policy*, 50, 202–213.

Crane, E. (2020). Woodlands for climate and nature: A review of woodland planting and management approaches in the UK for climate change mitigation and biodiversity conservation. Report to the RSPB. Royal Society for the Protection of Birds.

Crouzeilles, R., Barros, F. S. M., Molin, P. G., Ferreira, M. S., Junqueira, A. B., Chazdon, R. L., Lindenmayer, D. B., Tymus, J. R. C., Strassburg, B. B. N., & Brancalion, P. H. S. (2019). A new approach to map landscape variation in forest restoration success in tropical and temperate forest biomes. *Journal of Applied Ecology*,*56*(12): 2675–2686

Crouzeilles, R., Beyer, H. L., Monteiro, L. M., Feltran-Barbieri, R., Pessôa, A. C. M., Barros, F. S. M., Lindenmayer, D. B., Lino, E. D. S. M., Grelle, C. E. V., Chazdon, R. L., Matsumoto, M., Rosa, M., Latawiec, A. E., & Strassburg, B.

B. N. (2020). Achieving cost-effective landscape-scale forest restoration through targeted natural regeneration. *Conservation Letters*, *13*(3): 1-17.

Cuenca, P., Robalino, J., Arriagada, R., & Echeverria, C. (2018). Are government incentives effective for avoided deforestation in the tropical Andean Forest? *PLoS One*, 13(9), e0203545

Das, B., Bordoloi, R., Deka, S., Paul, A., Pandey, P. K., Singha, L. B., Tripathi, O. P., Mishra, B.P., & Mishra, M. (2021). Above ground biomass carbon assessment using field, satellite data and model based integrated approach to predict the carbon sequestration potential of major land use sector of Arunachal Himalaya, India. *Carbon Management, 12*(2): 201–214.

Dass, P., Houlton, B. Z., Wang, Y., & Warlind, D. (2018). Grasslands may be more reliable carbon sinks than forests in California. *Environmental Research Letters*, 13(7), 74027.

de Almeida, D. R. A., Stark, S. C., Valbuena, R., Broadbent, E. N., Silva, T. S. F., de Resende, A. F., Ferreira, M. P., Cardil, A., Silva, C. A., Amazonas, N., Zambrano, A. M. A., & Brancalion, P. H. S. (2020). A new era in forest restoration monitoring. *Restoration Ecology*, 28(1), 8–11.

de Souza, S. E. X. F., Vidal, E., Chagas, G. D. F., Elgar, A. T., & Brancalion, P. H. S. (2016). Ecological outcomes and livelihood benefits of community-managed agroforests and second growth forests in Southeast Brazil. *Biotropica*, 48(6), 868–881

De Vitis, M., Hay, F. R., Dickie, J. B., Trivedi, C., Choi, J., & Fiegener, R. (2020). Seed storage: Maintaining seed viability and Vigor for restoration use. *Restoration Ecology*, 28(S3): 1–7.

Deere, N. J., Guillera-arroita, G., Swinfield, T., Milodowski, D. T., Coomes, D. A., Bernard, H., Reynolds, G., Davies, Z. G., & Struebig, M. J. (2020). Maximizing the value of forest restoration for tropical mammals by detecting three-dimensional habitat associations. *Proceedings of the National Academy of Sciences of the United States of America*, 117(42): 26254–26262.

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., Hill, R., Chan, K. M. A., Baste, I. A., Brauman, K. A., Polasky, S., Church, A., Lonsdale, M., Larigauderie, A., Leadley, P. W., van Oudenhoven, A. P. E., van der Plaat, F., Schröter, M., Lavorel, S., … Shirayama, Y. (2018). Assessing nature's contributions to people. *Science, 359*(6373): 270–272.

Dolch, R., Ndriamiary, J., Ratolojanahary, T., Randrianasolo, M., & Ramanantenasoa, I. (2015). Improving livelihoods, training para-ecologists, enthralling children: Earning trust for effective community- based biodiversity conservation in Andasibe, eastern Madagascar. *Madagascar Conservation & Development, 10*(1), 21.

Domke, G. M., Oswalt, S. N., Walters, B. F., & Morin, R. S. (2020). Tree planting has the potential to increase carbon sequestration capacity of forests in the United States. *Proceedings of the National Academy of Sciences, 117*(40): 24649–24651

Douwes, E., & Buthelezi, N. (2016). Growing forests and communities. *Journal of Geography, 29*(5): 221–222

Dyderski, M. K., & Jagodziński, A. M. (2020). Impact of invasive tree species on natural regeneration species composition, diversity, and density. Forests, 11(4), 1–20.

Ennos, R., Cottrell, J., Hall, J., & O'Brien, D. (2019). Is the introduction of novel exotic forest tree species a rational response to rapid environmental change? A British perspective. *Forest Ecology and Management*, 432, 718–728

Erbaugh, J. T., & Oldekop, J. A. (2018). Forest landscape restoration for livelihoods and well-being. *Current Opinion in Environmental Sustainability*, 32, 76–83.

Erbaugh, J. T., Pradhan, N., Adams, J., Adams, J., Oldekop, J. A., Agrawal, A., Brockington, D., Pritchard, R., & Chhatre, A. (2020). Global forest restoration and the importance of prioritizing local communities. *Nature Ecology & Evolution., 4,* 1472–1476.

Estrada-Villegas, S., Bailón, M., Hall, J. S., Schnitzer, S. A., Turner, B. L., Caughlin, T., & van Breugel, M. (2019). Edaphic factors and initial conditions influence successional trajectories of early regenerating tropical dry forests. *Journal of Ecology*, 108, 160–174

Fagan, M. E., Reid, J. L., Holland, M. B., Drew, J. G., & Zahawi, R. A. (2020). How feasible are global forest restoration commitments? Conservation Letters, 13(3): 1–8.

FAO. (2019). Restoring forest landscapes through assisted natural regeneration (ANR) – A practical manual. Licence: CC BY-NC-SA 3.0 IGO. Food and Agriculture Organization of the United Nations, 52

FAO. (2020). *Global Forest Resources Assessment. Key Findings*. Available online: www.fao.org/forest-resources-assessment (accessed on 10 August 2023)

Feng, X., Fu, B., Piao, S., Wang, S., Ciais, P., Zeng, Z., Lü, Y., Zeng, Y., Li, Y., Jiang, X., & Wu, B. (2016). Revegetation in China's Loess Plateau is approaching sustainable water resource limits. *Nature Climate Change, 6*(11), 1019–1022.

Florentine, S. K., Pohlman, C. L., & Westbrooke, M. E. (2016). The effectiveness of different planting frameworks for recruitment of tropical rainforest species on ex-rainforest land. *Restoration Ecology, 24*(3), 364–372

Fofana, B., Sacande, M., Blagna, F., Dibloni, T. O., Compaore, E., Sanon, K. B., Maiga, Y., & Ouattara, A. S. (2020). Boosting land restoration success in the Great Green Wall through the use of symbiotic microorganisms for propagated tree seedlings. International, *Journal of Biological and Chemical Sciences, 14*(1), 110–125.

Freitas, M. G., Rodrigues, S. B., Campos-Filho, E. M., do Carmo, G. H. P., da Veiga, J. M., Junqueira, R. G. P., & Vieira, D. L. M. (2019). Evaluating the success of direct seeding for tropical forest restoration over ten years. *Forest Ecology and Management, 438*, 224–232.

Friggens, N. L., Hester, A. J., Mitchell, R. J., Parker, T. C., Subke, J. A., & Wookey, P. A. (2020). Tree planting in organic soils does not result in net carbon

sequestration on decadal timescales. *Global Change Biology, 26*(9): 5178–5188

Gann, G. D., McDonald, T., Walder, B., Aronson, J., Nelson, C. R., Jonson, J., Hallett, J. G., Eisenberg, C., Guariguata, M. R., Liu, J., Hua, F., Echeverría, C., Gonzales, E., Shaw, N., Decleer, K., & Dixon, K. W. (2019). International principles and standards for the practice of ecological restoration. *Restoration Ecology, 27*(S1), S1–S46.

Gardon, F. R., de Toledo, R. M., Brentan, B. M., & Ferreira dos Santos, R. (2020). Rainfall interception and plant community in young forest restorations. *Ecological Indicators,* 109, 105779

Heilmayr, R., Echeverría, C., & Lambin, E. F. (2020). Impacts of Chilean forest subsidies on forest cover, carbon and biodiversity. *Nature Sustainability, 3*(9), 701–709.

Höhl, M., Ahimbisibwe, V., Stanturf, J. A., Elsasser, P., Kleine, M., & Bolte, A. (2020). Forest landscape restoration – What generates failure and success? *Forests, 11*(9), 938.

Holl, K. D., & Brancalion, P. H. S. (2020). Tree planting: Not a simple solution. Science, 368(6491), 580–581.

Hong, S., Yin, G., Piao, S., Dybzinski, R., Cong, N., Li, X., Wang, K., Peñuelas, J., Zeng, H., & Chen, A. (2020). Divergent responses of soil organic carbon to afforestation. *Nature Sustainability, 3*(9), 694–700

Hoque, M. Z., Cui, S., Islam, I., Xu, L., & Ding, S. (2021). Dynamics of plantation forest development and ecosystem carbon storage change in coastal Bangladesh. *Ecological Indicators*, 130, 107954

Horák, J., Brestovanská, T., Mladenović, S., Kout, J., Bogusch, P., Halda, J. P., & Zasadil, P. (2019). Green desert? Biodiversity patterns in forest plantations. *Forest Ecology and Management,* 433, 343–348.

Hu, J., Herbohn, J., Chazdon, R. L., Baynes, J., & Vanclay, J. (2020). Silvicultural treatment effects on commercial timber volume and functional composition of a

selectively logged Australian tropical forest over 48 years. Forest *Ecology and Management, 457*, 117690.

IUCN. (2020). Guidance for using the IUCN global standard for nature-based solutions. A user-friendly framework for the verification, design and scaling up of nature-based solutions (1st ed.). IUCN

Kaushal, S., & Baishya, R. (2021). Stand structure and species diversity regulate biomass carbon stock under major central Himalayan Forest types of India. *Ecological Processes*, *10*(1): 1–18.

Kildisheva, O. A., Dixon, K. W., Silveira, F. A. O., Chapman, T., Di Sacco, A., Mondoni, A., Turner, S. R., & Cross, A. T. (2020). Dormancy and germination: Making every seed count in restoration. *Restoration Ecology, 28*(S3), S256–S265

Köhl, M., Neupane, P. R., & Mundhenk, P. (2020). REDD+ measurement, reporting and verification – A cost trap? Implications for financing REDD+MRV costs by result-based payments. *Ecological Economics,* 168, 106513.

Körner, C. (2017). A matter of tree longevity. Tree longevity rather than growth rate controls the carbon capital of forests. Science, 355(6321), 130–131

Kull, C. A., Harimanana, S. L., Radaniela Andrianoro, A., & Rajoelison, L. G. (2019). Divergent perceptions of the 'neo-Australian' forests of lowland eastern Madagascar: Invasions, transitions, and livelihoods. J*ournal of Environmental Management*, 229, 48–56

Kwiri R, Mujuru FM, Gwala W. (2020) Nutrient Composition and Bioactive Components of Mopane Worm (Gonimbrasia belina). African Edible Insects as Alternative Source of Food, Oil, Protein and Bioactive Components: *Springer* p. 241–56

Lewis, S. L., Wheeler, C. E., Mitchard, E. T. A., & Koch, A. (2019). Regenerate natural forests to store carbon*. Nature,* 568, 25–28.

Liu, Q., Zhang, Q., Yan, Y., Zhang, X., Niu, J., & Svenning, J.-C. (2020). Ecological restoration is the dominant driver of the recent reversal of desertification in the Mu Us Desert (China). *Journal of Cleaner Production,* 268, 12224

Mattana, E., Peguero, B., Di Sacco, A., Agramonte, W., Encarnación Castillo, W. R., Jiménez, F., Clase, T., Pritchard, H. W., Gómez-Barreiro, P., Castillo-

Lorenzo, E., Terrero Encarnación, M., Way, M. J., García, R., & Ulian, T. (2020). Assessing seed desiccation responses of native trees in the Caribbean. *New Forests, 51*(4), 705–721.

Maxwell, S. L., Evans, T., Watson, J. E. M., Morel, A., Grantham, H., Duncan, A., Harris, N., Potapov, P., Runting, R. K., Venter, O., Wang, S., & Malhi, Y. (2019). Degradation and forgone removals increase the carbon impact of intact forest loss by 626%. *Science Advances, 5*(10), 2546

Molin, P. G., Chazdon, R., de Barros, F., Ferraz, S., & Brancalion, P. H. S. (2018). A landscape approach for cost-effective large-scale forest restoration. Journal of Applied Ecology, 55(6), 2767–2778.

Moomaw, W. R., Masino, S. A., & Faison, E. K. (2019). Intact forests in the United States: Proforestation mitigates climate change and serves the greatest good. *Frontiers in Forests and Global Change,* 2, 1–10.

Musundire R, Ngonyama D, Chemura A, Ngadze RT, Jackson J, Matanda MJ, (2021). Stewardship of wild and farmed edible insects as food and feed in Sub-Saharan Africa: A perspective. Frontiers in Veterinary Science. 2021; 8:102-114

NCC (Natural Capital Committee). (2020). Advice on using nature-based interventions to reach net zero greenhouse gas emissions by 2050. Department for Environment, Food and Rural Affairs, HM Government, 26 p

Neuenkamp, L., Prober, S. M., Price, J. N., Zobel, M., & Standish, R. J. (2019). Benefits of mycorrhizal inoculation to ecological restoration depend on plant functional type, restoration context and time. *Fungal Ecology*, 40, 140–149.

Oldekop, J. A., Sims, K. R. E., Karna, B. K., Whittingham, M. J., & Agrawal, A. (2019). Reductions in deforestation and poverty from decentralized forest management in Nepal. *Nature Sustainability, 2*(5): 421–428

Parsa, V. A., Salehi, E., Yavari, A. R., & van Bodegom, P. M. (2019). Evaluating the potential contribution of urban ecosystem service to climate change mitigation. *Urban Ecosystems, 22*(5): 989–1006

Pedrini, S., & Dixon, K. W. (2020). International principles and standards for native seeds in ecological restoration. *Restoration Ecology,* 28(S3), S286–S303.

Pedrini, S., Dixon, K. W., & Kildisheva, O. A. (2020). Seed enhancement: Getting seeds restoration-ready. *Restoration Ecology, 28*(S3).12-25

Pedrini, S., Gibson-Roy, P., Trivedi, C., Gálvez-Ramírez, C., Hardwick, K., Shaw, N., Frischie, S., Laverack, G., & Dixon, K. (2020). Collection and production of native seeds for ecological restoration. *Restoration Ecology, 28*(S3), S228–S238.

Perino, A., Pereira, H. M., Navarro, L. M., Fernández, N., Bullock, J. M., Ceausu, S., Cortés-Avizanda, A., van Klink, R., Kuemmerle, T., Lomba, A., Pe'er, G., Plieninger, T., Rey Benayas, J. M., Sandom, C. J., Svenning, J., & Wheeler, H. C. (2019). Rewilding complex ecosystems. *Science*, 364, eaav5570

Reid, J. L., Fagan, M. E., Lucas, J., Slaughter, J., & Zahawi, R. A. (2019). The ephemerality of secondary forests in southern Costa Rica. *Conservation Letters, 12*(2): 1–7.

Rezende, G. M., & Vieira, D. L. M. (2019). Forest restoration in southern Amazonia: Soil preparation triggers natural regeneration. *Forest Ecology and Management*, 433, 93–104.

Ritter, C. D., Häggqvist, S., Karlsson, D., Sääksjärvi, I. E., Muasya, A. M., Nilsson, R. H., & Antonelli, A. (2019). Biodiversity assessments in the 21st century: The potential of insect traps to complement environmental samples for estimating eukaryotic and prokaryotic diversity using high-throughput DNA metabarcoding. *Genome, 62*(3): 147–159.

Rozendaal, D. M. A., Bongers, F., Aide, T. M., Alvarez-Dávila, E., Ascarrunz, N., Balvanera, P., Becknell, J. M., Bentos, T. V., Brancalion, P. H. S., Cabral, G. A. L., Calvo-Rodriguez, S., Chave, J., César, R. G., Chazdon, R. L., Condit, R., Dallinga, J. S., De Almeida-Cortez, J. S., De Jong, B., & De Oliveira, A., … Poorter, L. (2019). Biodiversity recovery of Neotropical secondary forests. Science Advances, 5(3):3114

Seddon, N., Chausson, A., Berry, P., Girardin, C. A. J., Smith, A., & Turner, B. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. Philosophical Transactions B: *Biological Sciences,* 375., 15-35.

Seddon, N., Turner, B., Berry, P., Chausson, A., & Girardin, C. A. (2019). Grounding nature-based climate solutions in sound biodiversity science. *Nature Climate Change*, 9, 84–87

Shaw, N., Barak, R. S., Campbell, R. E., Kirmer, A., Pedrini, S., Dixon, K., & Frischie, S. (2020). Seed use in the field: Delivering seeds for restoration success. *Restoration Ecology, 28*(S3). 14-45.

Steur, G., Verburg, R. W., Wassen, M. J., & Verweij, P. A. (2020). Shedding light on relationships between plant diversity and tropical forest ecosystem services across spatial scales and plot sizes. *Ecosystem Services,* 4, 101107-101110.

ter Steege, H., Prado, P. I., Lima, R. A. F. D., Pos, E., de Souza Coelho, L., de Andrade Lima Filho, D., Salomão, R. P., Amaral, I. L., de Almeida Matos, F. D., Castilho, C. V., Phillips, O. L., Guevara, J. E., de Jesus Veiga Carim, M., Cárdenas López, D., Magnusson, W. E., Wittmann, F., Martins, M. P., Sabatier, D., Irume, M. V., … Pickavance, G. (2020). Biased-corrected richness estimates for the Amazonian tree flora. Scientific *Reports, 10*(1): 1–13

Tolangay, D., & Moktan, S. (2020). Trend of studies on carbon sequestration dynamics in the Himalaya hotspot region: A review. *Journal of Applied and Natural Science, 12*(4): 647–660.

Whittet, R., Cottrell, J., Cavers, S., Pecurul, M., & Ennos, R. (2016). Supplying trees in an era of environmental uncertainty: Identifying challenges faced by the forest nursery sector in Great Britain. *Land Use Policy,* 58, 415–426

Wyse, S. V., & Dickie, J. B. (2018). Taxonomic affinity, habitat and seed mass strongly predict seed desiccation response: A boosted regression trees analysis based on 17 539 species. *Annals of Botany, 121*(1), 71–83.

Siegner, M., Panwar, R. and Kozak, R. (2021), "Community forest enterprises and social enterprises: the confluence of two streams of literatures for sustainable natural resource management", *Social Enterprise Journal,* 17 (4):584-603.

Assessment and Blended Learning: Learner-Centric Conduits to Physical Education Practical in Tertiary Learning Institutions of Zimbabwe.

Prince Chimonero

Abstract

Quality physical education teaching is hinged on assessment. Meagre approaches offset the development of learners' skill sets and movement repertoire prematurely ending envisaged aspirations. This article explored assessment and blended learning as critical learner-centric conduits providing new pigment to Physical Education pedagogical approaches. This descriptive study adopted a quantitative approach operationalized within "The Skill Theme Model" framework. A sample of 44 Physical Education lecturers and students from Great Zimbabwe University and Masvingo Teachers College was used for the study. Purposive sampling was used to draw up the study respondents. Questionnaires were used as data collection tools for the study. All data were summarised and presented in tables. Preliminary findings revealed assessment and blended learning deficiencies in tertiary Physical Education due to financial and resource scarcity. Technologically mediated expertise and learner-oriented approaches remain a challenge hence learners' critical superglue dimensions to athletic development in the psychological and physiological domain were not fully addressed. Multi-modal training batteries that developmentally test learners' socio-psychological and physiological multi-skill sets hinged on learner-centric health-enhancing blended approaches are crucial. Assessment tests should be regularly administered as they form the cornerstone to the achievement of learners' life-long capabilities.

Key Words: assessment, pedagogy, blended teaching, skill, learner-centric

1.1 Introduction

Assessment is the benchmark for quality Physical Education from micro settings to global systems. Despite the global interest in assessment (Wessley, Conor, Diarmuid, Sarahjane, Duncan, Donovan, Chambers & Utesch 2023; Liu & Chen, 2020), assessment conceptualization remains elusive largely due to different theoretical perspectives and operational frameworks (Gray, Sandford, Stirrup, et al., 2021; Rudd et al., 2021). Regarding the significance of assessment in research, practice and policy frameworks, care literature synthesis (Edwards Byrand, Keegan et al., 2018), requires much consideration. Considerably, assessment is an essential corridor to quality Physical Education (Saliminin et al., 2018) focusing on the critical constructs of psychomotor and socio-psychological. Its techniques encompass assessment for learning (AfL) and assessment of learning (AOL) reflecting systematic and objective continuous process formally carried out (Dyson, Howley, & Wright, 2021). While the assessment process forms the crux of PE pedagogy (Frapwell, 2010), it is a valid tool that serves to measure accountability and is a critical informant to learners and multiple stakeholders on the aptness and efficacy of a physical education programme.

Assessment is hinged on nationally driven goals from existing governmental and Educational Policies that underpin the Curriculum via expert-driven skill sets (Dyson, 2014). With transitionalised societal and educational cultures, PE lecturers need to cross-examine essential ingredients of AFL in their practical pedagogical approaches to assess its sustainability. Thus, knowledge of what assessment entails, its purpose, protocols involved and reasons for assessment is critical to enact learning movement within adopted frameworks.

Much literature has revolved around achievement needs (Chan et al., 2011) than product-driven needs that wholly develop students' foundational health, skill-related and competence-based dimensions (Haugen, 2021; Griban et al., 2020). China, for instance, adheres to sport centric policies, ideas and governmental interventions, innovative programming to meet student-athletes and citizens needs through sport for-all-systems that co-develop elite and mass sport (Haugen, 2021). Certainly, an assessment-blended-matrix potentially develops student's meta-cognitive aptitudes to

elite levels. Yet these foundational pedagogical practice gaps still remain underdeveloped in Zimbabwean tertiary PE teaching. Subsequently, PE lecturers are ensnared by the question: What kinds of support do Physical Education lecturers need to develop educationally sound, successful and sustainable forms of assessment? If performances of physical, psychological, emotional and social skills are the valued outcomes, this necessitates measurement. If students' learning is valued then their movement culture becomes a keystone driving assessment. More importantly, carefully selected pedagogical approaches become critical golden delivery tenets. This article explored PE pedagogical practical gaps to abridge student-elite athlete continuum in sport specifically delving into assessment-hybrid-learning as potentiating conduits to inventive and authentic learner-centric approaches. This could develop sustainable, real and synchronous PE pedagogical approaches aligned to the Ministry's Education 5.0 mantra.

1.2 Research questions

1.2.1 How far do assessment and blended learning complement each other in Physical Education teaching?

1.2.2 What is the basis upon which assessment should be carried out in Physical Education?

1.3 Review of related literature

1.3.1Theoretical underpinning

This study adopted Graham, Holt/Hale, and Parkers' (1998) Skill Theme Approach Model underpinned by two major concepts of movement concept and skills theme. Movement concepts are modifying descriptors of how skills can be performed in various settings. Skill themes assume a spiral sequence linked to generic levels of skill proficiency. At the pre-control level, designed learning experiences assist learners in gaining basic body concepts and space awareness while the control level develops learners' concepts of space awareness, movement effort, and relationship components. At the utilization level focus shifts to complex/intricate relationships

combining space and effort. Upon attainment of high levels of skill proficiencies, learning engagements now focus on mini-game versions delved towards improving their skill sets in more complex situations in individual and team sports. This continuum enables lecturers to assess and profile students' motoric development and competencies providing a critical stepping stone to grading and feedback.

1.3.2 Philosophical underpinning

Ancient Greeks believed that physical activity influenced brain chemistry and cognitive function. Mental resilience and the body were intimately related to physiological coordinative settings (Basch 2011). Prudence, justice, fortitude, and temperance were central virtues that housed the existing interconnectedness of the body and soul (Mares, 2019). The body's wisdom provides a rich basis for healthy conditions (Pisk, 2017) and the melodious bond of one's body enacted through knowledge-incurring physical activities (Ren, Gui & Chen 2019). This awakened Greek citizens from elements of unobserved theoretical existence (sedentary) towards practicalised ways of living (exercise) (Mares, 2019). Considerably, physical activity engagements interconnect bodily executive functioning that increases oxygen saturation, angiogenesis, enhancing brain neurotransmitters and neurotrophins that sustain neuronal processes (Ploughman, 2008). Subsequently, pedagogical approaches that engage the body and mind are essential. Hence, an assessment-hybrid learning matrix could serve as conduit for addressing this pedagogical gap via authenticated inventive environments.

1.3.3 Complementing blended teaching and learning in Physical Education

The phenomenon of Education 5.0 is a transitioning mantra impacting PE in response to the 4th industrialisation. Humans and machines require synchronised approaches to abate existing problems through innovations (Series, 2019). Thus, lecturers should be responsive to quality Physical Education delivery modes shifting from traditional approaches to blended learning models (Waha & Davis, 2014). Meaningful pedagogical changes require alignment of practice architectural innovativeness with intended learning outcomes and their contextual applications (Goodyear, Casey &

Kirk, 2017). Hence inventive minds should considerably be the cornerstone to evidence-informed practical engagements to keep industrialisation afloat.

Blended teaching and assessment are critical cogs (Fisher et al., 2018) whose attractiveness and potential in institutions still remain untapped (Yuping et al., 2015). Blended learning is controversially a diverse and embryonic area of innovation and exploration (Halverson et al., 2014) hinged on the interrelatedness of learning modalities. Assessment process is borne out of delivery approaches of the lecturer. Blended learning is an innovation that gives teaching a new pigment to PE teaching-learning processes (Kastena et al., 2020). Blended learning becomes an adaptive, dynamic, self-organising, co-evolving complex system that combines face-to-face and technology-mediated learning (Fisher et al., 2018) in interactive or non-interactive settings (Waha & Davis, 2014). Learners' classroom-oriented activities and assignments are accessible via internet services (Kastrup et al., 2018) through mobile and off-line platforms (Siyadi et al., 2017). Dewiyogo (2016) avers that blended learning expands learning and training scopes in sports and health and provides learner adjustment needs thereby amplifying learning attractiveness and motivation. Learners can process information based on perceived environmental cues (Masgumelar & Davis, 2019). Its web-based technological advancements can input, process and produce better learning outcomes (Yueh et al., 2012) especially in target, invasion, net/wall, striking and fielding games (Karamizadeh et al., 2012).

Transitionalising learners from video learning invokes and transform their aptitudes into authentic practical engagements. Merging Face-to-face and online learning triggers collaborative and cooperative learning which constitute key delivery modes (Cooner, 2016). This mode of delivery extends students' self-reflections, self-direction, and self-management skills (George & Keefle, 2010) magnifying purposeful communicative learning (Okaz, 2015). Despite its usefulness, blended learning may present resource challenges for students and institutes, and lack of public understanding on the use of technology (Masgumelar & Dwiyogo, 2019). Thus far strong financial resources critically ascertain meaningful implementation. Figure 1 below depicts how face-to-face, online and blended learning interlink:

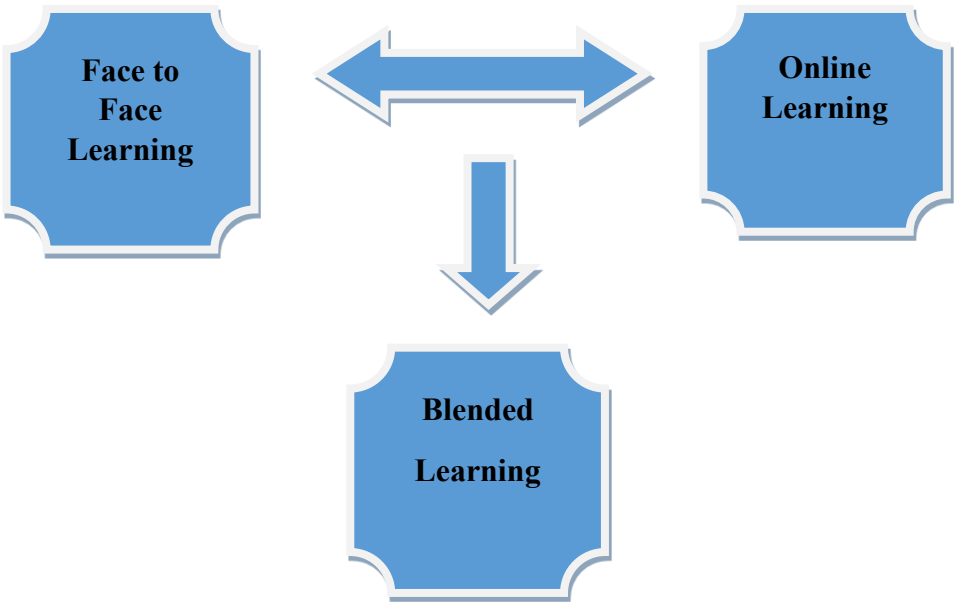

Figure 1: Blended Learning Scheme (Kastrena et al., 2020:147, International Global Educational Conference).

1.3.4 Assessment in Physical Education

Teachers, as figureheads, are pace setters for all learning engagements due to diverse skill sets, knowledge, and pedagogical abilities. Chan et al. (2011) observed that assessment critically determines one's delivery continuum and defines the envisaged end product. Thus, formative and summative assessments are essential sub-sets of assessment shaping the teaching-learning framework.

Assessment entails the process of gathering, recording, interpreting, using and reporting information about a learner's progress and achievements regarding knowledge, skills and attitudes (National Council for Curriculum and assessment, 2007). Significantly it communicates the value within and across schools and educational systems (Hay & Penny, 2013). From a social-critical lens assessment, it collates information within education settings for interpretive judgements about students. Sufficiently, this indicates learners' ownership to learning (Priest & Gross, 2005) through AFL and AOL (Hadiana, 2015) buttressed with policy and practice

contexts of the information use. Admittedly, assessment is thus an authentic tool that informs learners and important stakeholders on the suitability and efficacy of an educational programme (Frapwell 2010). Griban et al. (2020) opines that assessment done for learning accountability provides critical enlightening information on the quality of performance on physical literacy, game coping, and skill proficiency levels in view of adopted pedagogical approaches.

AOL (summative) measures and assesses levels of students' skills achievements at the end of a learning episode based on a series of performance criteria and results for learners' final grading. This mode of assessment is nested upon the teacher's authority and assists in identifying students' levels of achievement (Earl, 2012). AFL provides feedback suggesting improvements on learning outcomes while summative assessment gives value to learning outcomes in a certain period (Hadiana, 2015). AFL gathers information for feedback purposes on students' personal learning achievements informing lecturers about subsequent planning and pedagogy. It becomes formative if information regarding learners' achievement is brought forth, understood and used by lecturers, learners or their peers to make decisions about the next step of instruction (lecturer-inclined). This improves learning and shapes learner's progress (Chan et al., 2018).

AFL can be institutionally-based (internal) or club-based (coaches/trainers-based) (Fitriady et al., 2022). Subsequently, evaluation of students' motor assessment processes is further upheld to higher settings of skill development in chosen sport codes via expert-driven platforms. Plugging this leisure sports participation gap could elicit positive attitudinal and attainment of elite performance levels in sport. This presumably provides insights into professional aspirations given that in-school curriculum would have foundationally provided them with the critical 'educational component' that sets up a vibrant sporting culture.

William and Leahy (2015) have raised three pertinent assessment questions, namely: Where is the learner going? Where is the learner right now? How will the learner get

there? This process is more progression focused than achievement focused. William and Leahy (2015) further expounded 5 guiding principles to AFL; first, clarified learner-centric environments; second, engineering effective classroom dialogues, evidence-based learning tasks/activities third, constructive learner-feedback; fourth, activating peer learning forums and fifth, permitting students' personal endorsements. The argument is that the 5.0 pillars consent to application of multi-assessment techniques by PE lecturers. For instance, administering flexibility tests (Winget test, Sit and Reach test) aerobic and anaerobic endurance fitness tests (Cooper's 12-minute run Test). Lopez-Pastor et al. (2013) rightly argue that learner-centric assessment modes place the student as a 'critical participant' in the assessment-learning continuum. For instance, role delineation in team sports (Bardid et al., 2020). Taken from a socio-cultural dimension, AFL should consider relevance and legitimacy based on learner's perspective. Basing on Lope-Pastor et al. s' (2013) leaner-centric approach, students have the right to know content to be learnt and expected standards in advance to consent to their fair assessment. In fact, formative assessments require synchronisation with teacher's periodic feedback aligned with pre-laid strategic goals and assessment benchmarks. Well-planned AFL informs the most efficient, noteworthy and valuable instructional lines of attack to improve teaching and successive students' learning engagements (Tunnel et al., 2013). Thus, inventive peer motivational grounds on assessments significantly provide alignment with learning purposes, teaching practice and assessment achievements (Rodelius & Hay, 2012).

1.4 Basis for assessment in PE

1.4.1 Assessment of motoric competencies

Motor development is critical for general health and growth, cognitive and social aspects in humans (Gallahue et al., 2012). Motor competence levels reflect the degree of proficiency to perform various skills, coordinative control and movement quality processes. In light of the significance that motor competence has in health behaviours, consideration of appropriate instruments for assessing and monitoring competence in learners (Bardid et al., 2020) is crucial in PE.

1.4.2 Protocols and assessment tools

Assessment modes evaluate children and adolescents' motor competences in educational and non-educational fora (Hands et al., 2015) through appropriately chosen instruments that accurately serve the intended purpose. They also evaluate attributes of individual motor competence and, motor delay screening, talent identification in sports, design and evaluation of physical activity, intervention programs and examination of interlinks between motor competence and health trajectory (Hardy et al., 2012).

This is objectively done using motion devices and observational methods that directly capture personal movement behaviour with minimum bias and measurement error. They accurately estimate motor competence (Bardid et al., 2020) and movement analysis of motor skills biomechanically through high-speed cameras, motion sensors, force plate and software enhancing quantitative assessment of human movement. Devices are handy in enumerating kinetics, kinematic/dynamic sports movement and observational infield performance tests (Bisi et al., 2017) as can be the case of a volleyball smash.

Observation methods allow systematic view and record the athlete's performance in given sets of motor skill tasks through live coding despite difficulties presented from some object-controlled skills in multi-component skill performances requiring evaluation (Barnett et al., 2017). They have specific guidelines with process-inclined measures. Product-oriented assessment tests motor proficiency levels (Herman et al., 2017) and outcome of movement based on speed and trajectory of ball bounce. With regards to process-oriented assessments, for instance, Test of Gross Motor Development focuses more on movement quality. Of note, numerous observation methods could be static since motor skill performance follows iterative sequence of instruction and performance.

1.4.3 Subjective methods

Subjective techniques use proxy reports and are cheaper methods for assessing large number of athletes than objective assessments. Self-reports are based on the individual athlete's authentic motor competences (Bardid et al., 2020). Thus, correct psychomotor-matching developments are most likely to invoke their perception levels eventually igniting their constructs of interests (Barnett et al., 2016). Proxy reports potentially identify student-athletes with atypical motor development (Developmental Coordination Disorders). They serve as extra informational sources in identifying cases of DCD to allow for clear evaluation. For example, a Development Disorder Questionnaire and Movement Battery is an assessment tool for check listing children's daily errand functional and self-care skills.

1.4.4 Social-emotional skills tests

Social-emotional skills stem from formal learning experiences and steer diverse upshots throughout one's life (De Fruyt et al., 2015). They assess athletes' cognitive intra-personal processes (emotions, moral fibre, confidence, engagements, social) and technical skills (physical literacy) (The OECD, 2015). These can be further tested using ambulatory assessment. Their multiple data points provide a rich variety of information on experiential variations over short frames and contexts (Zirkel et al., 2015). Situational judgement tests assess social-emotional skills via a set of hypothetical scenarios with several workable courses of action in relation to test design based on varied response rankings in given situations. For instance, multiple response options from a given set. It enlivens research, practice and policy making it a highly esteemed application in education (Anderson et al., 2017). These tests open insights into student's functional dynamics and how situational variability shapes this social emotional skill variability (Jones et al., 2017). Considerably athletes' socio-psychological and emotional dimensions on dynamic team-oriented tasks are critical constructs to be assessed.

1.4.5 Rubrics as Likert-scale anchors

These make use of behaviourally anchored scales using skill levels defined in rubrics as anchors (‘agree’, ‘disagree’, ‘fully agree’, or ‘fully disagree’). Rubrics denote a set of quality criteria for scoring performance types (Allen & Tanner, 2006) in formative and summative feedback for grading of athletes’ performances (Panadero & Jonsson, 2013). Rubrics support instruction and learning since the defined skill levels create clear expectations of performance enabling transparency during scoring and feedback. Rubric-oriented criteria assist learners in self-reflecting their proficiencies and allow for performance re-adjustments (Panadero & Jonsson, 2013). Rubrics can enhance internal consistency of test scores in topic-specific or specific dimensions of performance as the scoring system is well defined.

1.5 Assessment challenges

Challenges regarding assessment purpose, content and skills/abilities to be measured exist (Zhou, 2015). Redelius and Hay (2012) found out that Swedish students perceived assessment criteria to be critical but could not comprehend its dimensions. This implicitly elicits ad hoc assessment approaches and expertise deficiency gaps. Australian students observed PE assessment to be delved towards skill assessment in different physical engagements and team cohesion abilities (Chan et al., 2011). Further, insufficient student guidance and understanding on what is to be actually done lacked (Redelius et al., 2015). While Aarskog’s (2020) Norwegian study confirmed foundational reflective feedback on students’ PE assessments, Svengberg et al. (2018) however, observed that lecturers’ incapacities compromised goal achievement ultimately risking conducting assessment protocols on equitable grounds.

2.0 Methodology

This descriptive cohort study anchored on the quantitative approach. Its population was 44 participants comprising Physical Education lecturers and students from Great Zimbabwe University and Masvingo Teachers College. Purposive sampling was used to draw up the sample of participants for the study. Close-ended questionnaires were used as data collection tools for the study. Cronbach alpha statistics determined the

internal consistency of the questionnaire items. The test yielded the Cronbach's Alpha of 0.8 which indicates acceptable reliability. The instrument was pilot-tested using a smaller related sample of Physical Education experts and students prior to its administration to the intended participants. The instrument's capacity to collect the intended data established its validity. Data presentation was performed using frequencies and presented on tables. Ethical clearance was sought from Great Zimbabwe University Research Department and Masvingo Teachers College administration. Informed consent was sought from study participants. Anonymity and Confidentiality of data were established in order to meet ethical standards.

3.0 Results and Findings

This section explicates major study findings based on the pre-stated research questions.

Table 1: Age distribution of students (N=30)

Age	**Male**		**Female**		**Total**	
	N (14)	%	N (16)	%	(n=30)	%
21 – 25	3	10%	5	16.7%	7	26.7%
26 – 30	8	26.7%	6	20%	14	46.7%
31^{+}	3	10%	5	16.7%	8	26.7%
TOTAL	14	46.7%	16	53.4%	29	100%

As shown most male students were in the age range of 26-30 years (26.7%) and females (20%) followed by the 21-25 and over 31 age ranges with 16.7% (females) and 10% (males). There were more female students (53.4%) than males (46.7%) though the figure difference could be insignificant.

Table 2: Bio-data of university and college lecturers

Background characteristics	**PE Lecturers N (14)**					
	Male (N 10) N	%	Female (N 4) N	%	Total n	%
Age group (years)						
35-40	-	-	-	-	-	-
41-50	2	14.3%	-	-	2	14.3%
51+	8	57.1%	4	28.6%	12	85.7%
Educational background						
PhD	1	7.1%	-	-	1	7.14%
M.Phil	2	14.3%	-	-	2	14.3%
MSc	-	-	1	7.14 %	1	7.14%
M. Ed	1	7.14%	1	7.14 %	2	14.3%
BSc honours (PES)	5	35.7%	1	7.14 %	6	42.9%
BSc PHES	12	85.7%	2	14.3 %	14	100%
B.Ed PHES	1	7.14%	1	7.14 %	2	14.3%
Diploma (PE Main)	3	21.42 %	1	7.14 %	4	28.6%
Experience						
5-8 years	2			14.3%		
9-12 years	9			64.3%		
13+	3			21.4%		
TOTAL	14			100%		

Most of the respondents were in the age range of over 51 years 12(85.7%) with the least number in the 41-50 categories 2(14.3%). There were more males 8(57.1%) than

females 2(14.3%). The widely held educational qualification is BSc PES 14(100%), followed by BSc honours, PES 6(42.9%), Diploma (PE Main) 4(28.6%), M.Phil 2(14.3%) with just 1 (7.14%) having a Doctorate in Sport Science. Most of the respondents have well over 9 years lecturing experience at tertiary institutes 12(85.7%) while only 2(14.3%) fall within the 5 to 8-year experience bracket. This suggests a mature group of experts in the field despite heterogeneous educational backgrounds regarding in-depth knowledge variations and assessment perceptions.

Table 3: Teachers' Questionnaire: Learning Outcomes on Assessment

Respondents N = 14					
AOL Principle	**Always**	**Regularly**	**Not often**	**Never**	**Total**
Context	10 (71.4%)	3 (21.4%)	1 (7.1%)	0%	14(100%)
Input	8 (57.1)	4 (28.6%)	2 (14.3%)	0%	14(100%)
Process	9 (64.3%)	3 (21.4%)	2 (14.3%)	0%	14(100%)
Product	7 (50%)	5 (35.7%)	2 (14.3%)	0%	14(100%)

Implementation of the learning outcome assessments is being done as shown by 10(71.4%) (Always), 3(21.4%) (Regular) while 1(7.1%) infrequently ventured into this exercise. This indicates AOL outcomes in Physical Education in tertiary institutions. About 8(57%) of the respondents inputted the aspect of assessment in view of the National and Institutional goals. Of the total, 4(28.6%) are regularly involved while 2(14.3%) infrequently carry out this exercise**.** Considerably, there is adherence to foundational assessment goals and plans by most tertiary institutions despite inconsistent reports from other institutions. About 9(64.3%) were consistent in conducting AOL outcomes routines with 3(21.4%) regularly involved while a segment of 2(14.3%) were occasionally engaged. This means that AOL outcomes in PE are being done assiduously. Regarding evaluation of AOL outcomes, half of the respondents (50%) adhered to assessment protocols with 5(35.7%) indicating habitual engagements while a portion of 2(14.3%) occasionally did this. Generally, this explicates a team of experts envisioned with product-oriented dimensions. The 0% across all the 4 (AOL) key principles (context, input, process, and product) certainly

indicate respondents' none involvement in agendas that are outside the frameworks of pre-laid PE goals.

Table 4: Students' Responses to Questions

Question (Results in % N = 30	**Never**	**1 time**	**2-3 times**	**4-5 times**	**Over 6 times**
Q1. Frequency of feedback from lecturers to improve competence in PE?	-	2 (6.6%)	5 (16.7%)	18 (60%)	5 (16.7%)
Q2. Frequency of times you spoke on competence aims in PE in class?	4 (13.3%)	7(23.3%)	9 (30%)	3 (10%)	7 (23.3%)
Q3. Frequency of times on self-assessments in PE work?	2 (6.6%)	4(13.3%)	6 (20%)	10 (33.3%)	8 (26.7%)
Q4. Frequency of times on peer evaluations regarding assessment?	3 (10%)	2 (6.6%)	5 (16.7%)	12 (40%)	10 (33.3%)
Q5. Rate your lecturer competencies in PE assessment	Don't know	Fair	Good	Very Good	Outstanding
	2 (6.6%)	6 (20%)	9 (30%)	6 (20%)	7 (23.3%)
Q6. Do you know the competence aims in PE?	Strongly disagree	Disagree	Agree	Strongly agree	Don't know
	-	1 (3.3%)	15 (50%)	12 (40%)	2 (6.6%)
Q7. Blended forms of learning are regularly used during PE learning	18(60%)	2(6.7%)	5(18.7%)	4(13.3%)	1(3.3%)

Regarding feedback that advances students' learning capacities, most students (18;60% and 5;16.7%) indicated having received timeous feedback often which provided significant learning engagements. Although these reports confirm positive feedback on students' competences, a larger section of them rated it as a none regularised point of discussion in PE classroom settings (66.6%, Never-3 times). This may not sufficiently qualify as on-going feedback vis-à-vis the next step in the learning

course of action despite the 10(33.3%) who reported full engagement in these critical discussions. Whereas the majority of students seem to value explorative roles of self-assessment and peer evaluation (80% and 90%) of AOL, about 19.9% (Self-evaluation) and 16.6% (Self-assessment) were reluctant on this issue. This could be attributed to students' knowledge deficiencies regarding the purpose of assessment. Further, such students could lack critical technical skill sets in practical performances, hence may show no interest in self-assessment and peer evaluation. Prompted with a question on proficiency level on administered assessment learning modes, most students rated their lecturers as good (30%), outstanding (23.3%) and very good (20%). Taken together, lecturers and students have considerably, well defined routes of what AFL entails on their parties. This is further maintained by a larger section of students (90%, agree; strongly agree) whose understanding was in sync with pre-laid competence aims and goals of PE. Only a segment of 6.6% appears to be grappling with what competence aims in PE entail. Blended forms of teaching and learning are rarely implemented during learner engagements as indicated by 60% (never) and 6.7% (disagree) of the students compared to 13.3% (strongly agree) and 18.7% (agree). This depicts a seriously existing pedagogical practical gap. Scarcity of technological advancements and technical expertise in institutions, inevitably, are major hindrances to upholding PE in view of prevailing High Misery Index Rates. In spite of these upheavals, other institutions engage students in these forms of learning, an indication of keeping abreast with technological advancements that potentiates practical authentic engagements.

4.0 Discussion

While the issue of hybrid learning forms the crux of transitionalised educational reforms of education 5.0, this may not sufficiently provide full a response to the 4th industrialisation era given the Misery Index Zimbabwe is currently undergoing. Although on paper it seems plausible to combine classroom engagements by way of technology-driven environments (Kastrup et al., 2018; Siyadi et al., 2017; Dwiyogo, 2016) financial constraints have seriously plagued most institutions. Turning to results of this study, blended forms of teaching and learning appear to be rarely put into reasonable practice despite a few who struggle to uphold this practice. Adequate to

say, though, biomarkers of this nature inevitably proliferate financial and resource scarcity institutions are undergoing due to the economic meltdown. Considerably, technological service gaps among implementers and institutions exist which need to be plugged. Hence, this de-popularises technology-mediated learning which expands the scope of learning, training and health, and the much-needed attractiveness and motivation (Fisher et al., 2018; Dewiyogo, 2016).

Given this backdrop of challenges on pre-laid National strategic goals, blended teaching and learning may not fully blossom to expected scales of the envisioned 4th industrialisation. In this case, unless the government takes full ownership through substantial funding, standardised assessment and measurements, Physical Education will remain a mystery of unfulfilled dreams for generations to come. This situation propagates significant deviance from a Series' 2019 study which advocated for the synchronisation of humans and machines to address existing societal problems through innovation and industrialisation. Further, its more unbearable for mentors and mentees to become more adaptive in aligning quality assessment tests and measurements in PE exonerating blended learning from traditional approaches (Waha & Davis, 2014). On these bases Masgumelar and Dewiyogo (2019) contemplates on media diversity, scarcity of facilities, infrastructure, insufficient resources and lack of public understanding of the use of technology. The authors' arguments, inexorably find a place in the current study findings as most participants were in common consent of how serious economic recession has impacted the Zimbabwean tertiary institutions educational system.

Although multiple assessment modes are learner-centric in their approaches (Lopez-Pastor, et al., 2013) focussing on evaluating children and adolescents' motor competences (Bardid et al., 2020) results of this study appear to be in sync with these findings. However, indications from this study seem to deviate from national and institutional goals as shown by segments of 14.3%. This is indicative of skill resource base gaps that exist in some quarters. The issues of adaptation to changes are slowly making some inroads with the issue of innovativeness and industrialisation still at infancy stages of development. On the other hand, the critical feedback modes of self-

evaluation and self-assessment in PE practical still remain unresolved glitches. This could be, in part, attributed to mentors and students' knowledge deficiency base levels regarding the purpose of assessment. This is significantly contrary to Aarskog's (2020) findings from a Norwegian study in which he advances on the capacity of students' participation in PE assessments from which more reflective feedback assessment proved to be foundational. However, different research settings could also account for results disparities. Thus, the aspects of authenticated learning seem to be a missing link regarding motivational grounds that constitute the drivers to self-authorship, ideal-self, self-sustenance and grading in relation to personal achievements. If assessment is literally taken from an ad hoc approach as Hay and Penny (2013) rightly observed, then learning may not yield any positive impact on the learner. The same can be said of hybrid teaching and learning. This infringes learners' rights to learn and lecturers' capacities to provide authenticated and inventive-oriented learning environments.

Evidence from this study suggests adherence to pre-laid legislative policies by some participants (80%) where explorative roles of self-assessment and peer evaluation in assessment of learning is assiduously done. These institutions could possibly be well resourced and have expertise with pre-requisite skill-sets aligned to contemporary modes of hybrid forms of teaching and learning. While AFL substantially inter-connects curriculum goals, Chan et al. (2018) stress that assessment need be taken as a critical tool in accounting for all learning. To this end PE lecturers and teachers are critical intermediaries responsible for steering the learner to the destiny of intent (innovative, researchers, high skill proficiencies, industrialised, value-added products). Considerably, it is worth taking to operate within the frameworks of William and Leahy's (2015) key questions if the pinnacle of contemporary pedagogy is to be realised: Where is the learner going? Where is the learner right now? How will the learner get there? Admittedly, there is need to drift from teacher-centric approaches (re-adjustment deficits) to more of hybridised Authentic Based Competence Synergist Models of Approach that unpacks learners' meta-cognitive skills transfer and kinaesthetic intelligence. These frames of reference could essentially become critical superglue conduits to practical engagements and assessment of students' motoric achievements. Consequently, keeping afloat of current pedagogical and assessment needs and methodological approaches is crucial in Higher Institutes of Learning.

5.0 Conclusions

Emerging findings from this study reveal deficiency trends in the way assessment in Physical Education is perceived and carried out in tertiary institutions. Use of blended teaching and learning is not highly regarded in most institutions due to strained financial and material resources. Technical expertise is still a challenge in terms of technological advancements hence assessments modes do not fully address learners' socio-psychological and physiological resource bases which are the mainstay to athletic developments.

6.0 Recommendations

Adoption of multi-modal monitoring batteries on individual learners' socio-psychological and physiological parameters is critical. Individual objective profiles to assess learner's theoretical and practical learning trajectories should form the epitome of multi-skill-set development through health-enhancing blended forms of teaching. Students' school assessment achievements should be inter-connected with club system sport through nationally-driven policies. There is need to increase frequency in assessment tests administration as they are the basis upon which learners' achievement of life-long processes are founded. Hands-on approaches through functional virtual escape rooms, generative AI, synchronous communication and collaborative applications in Higher learning institutions are essential. Upgrading lecturers' technical expertise base levels is essential to plug pedagogical gaps in Physical Education. Substantial funding is necessary to meaningfully churn out productive PE graduates.

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References

Allen, D., & Tanner, K. 2006. Rubrics; Tools for making learning goals and evaluation criteria explicit for both teachers and learners, *CBE Life Science Education,* 5: 197-203.

Aarskog, E. 2020. No assessment, no learning: Exploring student participation in assessment in Norwegian physical education (PE), *Sport, Education and Society*, 26(8): 875-888, http://dx.doi.org/10.1080/13573322.2020.1791064.

Bardid, F., Vannozzi, G., Logan, S, W., Hardy, L, C., & Barnett, L, M. 2020. A hitchhiker's guide to assessing young people's motor competence: Deciding what method to use, 1-30.

Barnett, L, M., Lai, S, K., Veldman, S, L, C. et al., 2016. Correlates of Cross Motor in children and adolescents: A Systematic Review and Meta-Analysis, *Sports Medicine*, 46(11): 1663-1668.

Becker, E, S., Goetz, T., Morger, V., & Renellucci, J. 2014. The importance of teachers' emotions and instructional behaviour for their students' emotions, An experience sampling analysis, *Teaching and Teacher Education*, 43: 15-26.

Barnett, L., Lubans, D., Solomon, J., et al., 2017. What is the contribution of Actual Motor Skill, Fitness and Physical Activity to Children's Self-Perception of Motor Competence? *Journal of Motion Learning Development*, 1-21.

Basch, C, E. 2011. Physical Activity and the Achievement Gap among Urban Minority Youth, *Journal of School Health*, 81(10): 626-634.

Bisi, M, C., Pocini, P, G., Polman, R., et al., 2017. Objective assessment of movement competence in children using wearable sensors: An Instrumented version of the TGMD-2 locomotor subtest*, Gait Posture,* 56: 42-52.

Bonslgnore, M, R., La Grutta, S., & Cibella, F. 2008. Effects of Exercise Training and molukastin Children with mild Asthma, *Medicine Science Sports Exercise,* 40: 405-412.

Carlson, T, B. 1995. We hate gym, Student alienation from physical education, *Journal of Teaching in Physical Education,* 14: 467-477.

Goodyear, V, A., Casey, A., & Kirk, D. 2017. Practice architectures and Sustainable Curriculum Renewal, *Journal of Curriculum Studies*, 49(2): 235-254

Cooner, T, S. 2016. Learning to create Inquiry-based Blended Learning Designs: Resources to Develop Interdisciplinary Education, 5479.

Corthiran, D, J., & Ennis, C, D. 1998. Curriculum of mutual worth: Comparison of students and teachers' curriculum goals, *Journal of Teaching in Physical Education*, 17: 307-326.

De Fruyt, F., Wille, B., & John, O, P. 2015. Employability in the 21st century: Complex (interactive) problem-solving and other essential skills, Industrial and Organisational Psychology: *Perspectives on Science and Practice*, 8: 276-281.

Dewiyogo, W, D. 2016. Pembelajaran Berbasis Blended Learning: Malang: Wineka Media.

Dyson, B., Howley, D., & Wright, P, M. 2021. A scoping review critically examining research connecting social and emotional learning with three Model-Based practices in physical education: Have we been doing this all along? *European Physical Education Review,* 27(1): 76-95.

Earl, L, M. 2012. Assessment as learning: Using classroom assessment to maximise students' learning, California, Corwin Press.

Edwards, L, C., Byrand, A, S., Keegan, R, J., et al., 2018. Measuring physical literature and related constructs: A systematic review of empirical findings, *Sports Medicine,* 48(3): 659-682.

Fisher, R., Perenyi, A., & Birdthistle, N. 2018. The positive relationship between flipped and blended learning and student engagement, performance and satisfaction, *Active Learning in Higher Education,* 00(0): 1-17.

Fitriady, G., Alfarizi, M., & Saputra, S, A. 2022. Optimisation of movement skills assessment in physical education learning using online self and peer assessment, *Journal of Science and Education,* 3 (2): 159-164.

Gallahue, D, C., Ozmun, J, C., & Goodway, J, D. 2012. Understanding Motor Development: Infants, Adolescents, Adults, 7th Ed, New York, McGraw Hill.

George-Walker, L., and Keefle, M. 2010. Self-determined blended learning; A Case Study of Blended Learning Design, *Higher Education Research Development,* 29: 1-13.

Gray, S., Sandford, R., Stirrup et al., 2021. A comparative analysis of discourses shaping physical education provision within and across the UK, *European Physical Education Review,* 28(3): 575-593.

Griban, G., Kunzietsova, O., Tkachenke, P., Oleniev, D., Khurtenko, O., Dikhtiarenko, Z., Yeromenko, E., Lytvynenko, A., Khatko, A., & Pustolakova, L. 2020. Formation of the Students' Volitional Qualities in the process of Physical Education, *International Journal of Movement and Sport Science,* 8(6): 505-517. http://www.hr.pub.org.

Hadiana, D. 2015. Peniillaian Hasil Beljah untuk Siswa Sekolah Dasar, *Jurnal Pendikikan Dan Kebudayaan,* 21(1): 15-26.

Halverson, L, R., Graham, C, R., Spring, K, A., et at., 2014. A thematic analysis of the most highly cited scholarship in the 1st decade of blended learning research, *The Internet and Higher Education*, 20: 20-34.

Hands, B., Lician, M., & Piek, J. 2015. A review of 5 tests to identify motor coordination difficulties in young adults, *Research Development Disability,* 41(42): 40-51.

Hardy, L, C., Hills, A, P., Timperio, A., et al., 2012. A hitchhiker's guide to assessing sedentary behaviour among young people: Deciding what method to assess, *Journal of Science Medicine in Sport,* 16(1): 28-35.

Haugen, M, B. 2021. Chinese-Student Athlete? A Socio-Cultural Examination of Education for Elite Chinese Athletes. (Dissertation). University of Illinois, Urban-Champaign.

Hay, P., & Penny, D. 2013. Assessment in Physical Education: A socio-cultural perspective, Routledge, New York.

Ikulayo, P, B. 1983. Attitudes of girls towards physical education: *Physical Education Review,* 6: 24-25.

Herman, C., Heim, C., & Seeilig, H. 2017. Constructs and correlates of basic motor competencies in primary school-aged children, Journal of Sport and Healing Science, Doi:10.1016/j.jshs.201704.002.

Jones, A, B., Brown, N, A., Sertass, D, G., & Sherman, R, A. 2017. Personality and Destiny distributions of behaviour, emotions and situations, *Journal of Research in Personality*, 69: 225-236.

Jones, B, A. 1988. A scale to measure the attitudes of school pupils towards their lessons in physical education, *Educational Studies*, 14: 51-63.

Karamizadeh, Z., Zarifsanayei, N., Faghihi, A, A., & Mohammadi, H, H, H. 2012. The Study of effectiveness of Blended Learning Approaches for Medical Training Learning Courses, *Iran Red Crescent Medicine Journal,* 14(1): 41-44.

Kastrena, E., Setiawan, E., & Adawiyah, A. 2020. Moving from Traditional Teaching to Blended Learning and Learning of Sports Test and Measurement Course to Improve Student' Learning Outcomes, Second International Conference and Innovation Exhibit on Global Education, Doi. https://doi.org/14.22236/ie.v1i1.109.

Kastrup, H., Mallow, J, V., Sari, P, M., Sudargo, F., & Priyandoko, D. 2018. Analysis of students' scientific attitude behaviour change effects blended learning supported by i-spring Suite 8 appli.

Kramer, T, A., Sacko, R, S., Pfeifer, C, G., Goins, J, M., & Stodden, D, F. 2019. The Association between the Functional Movement Screen, Y-Balance Test & Physical Performance Tests in Male and Female High School Athletes, International Journal of Sports Physical Therapy, 14(6): 911-919

Lee, A, M. 2013. Development of an instrument to access cognitive processes in physical education classes, *Research Quarterly for Exercise and Sport*, 68: 152-160.

Liu, Y., & Chen, S. 2020. Physical literacy in children and adolescents: Definitions, assessment and interventions, *European Physical Education Review,* 27(1): 45-51

Lopez-Pastor, V, M., Kirk, D., Lorente,-Catlin, E.,. et al., 2013. Alternative Assessment in physical education: *A review of International literature, Sport, Education and Society*, 18(1): 57-76.

Lyons, T., & Evans, M, M. 2013. Blended Learning to Increase Student Satisfaction: An Exploratory Study, 37-41.

Mares, C. 2019. Practical Role of Philosophy in Sport: Case of Philosophical Consultations, Physical Culture, Sports Studies & Research, https://Doi:10.2478/pssr-2019-0017.

Masgumelar, N, K., & Dwiyogo, W, D. 2019. Development of Game Modification Using Blended Learning in Physical Education, Sports and Health For Senior High School Students, *Advances in Health Sciences Research,* 29: 95-100.

Okaz, A, A. 2015. Integrating Blended Learning with Higher Education Pocedia*, Social Behaviour Science,* 186: 600-603.

Oppenhein, A, N. 1992. Questionnaire design, interviewing and attitude measurement, 3rd ed, pp. 13-103.

Panadero, E., & Jonsson, A. 2013. The use of scoring rubrics for formative assessment purposes revisited: A review, *Educational Research Review*, 9: 129-144.

Pavia, S., Hana, V., & Jan, V. 2015. Blended Learning: Promising Strategic Alternative in Higher Education Pocedia-Soc*, Behaviour Science*, 171: 1245-1254.

Pisk, J. 2017. Wisdom of the Body in Sport & Exercise Practices, Physical Culture and Sports Studies and Research, Vol LXXV: 15-22.

Ploughman, M. 2008. Exercise is Brain Food: The Effects of Physical Activity on Cognitive Function, *Developing Neuro-Rehabilitation*, 11: 236-240.

Putri, N, S., Hanani, E, S., & Annas, M. 2012. development of Games, Softball by Swingkasball Modification in SMAN, Libangani, *Journal of Physical Education, Sport, Health and Recreations,* 1(2): pp. 1-18.

Ren, Y., Gui, J., & Chen, Y. 2019. A Philosophical Interpretation of Ancient Greek Sports from the Philosophy of Art, *Argos,* 36(35): 244-253.

Rodelius, K., & Hay, P. 2012. Standard views on criterion-referenced assessment and grading in Swedish Physical Education, *Physical Education and Sport Pedagogy,* 17(2): 211-225.

Rudd, J, R., Woods, C., Seifert, L., & Davids, K. 2021. An ecological dynamics conceptualisation of physical education: where we have been and where we are to go next, *Physical Education and Sport Pedagogy,* 26(3): 293-306

Salimini, M, I., Shahril, J., Rahmat, A., Elumalai, I., Saad, L., et al., 2018. School-based assessment module for invasion games category in Physical Education, *Journal of Fundamental and Applied S*ciences, 10(15): 233-248.

Series, C. 2019. Edmondo-based blended learning on mathematics providing capability.

Siyadi, L., Kurniasih, N., & Subanti, S. 2017. The effectiveness of learning Material with Edmondo to Enhance the level of Students' Probabilistic Thinking, *Mathematics, Science and Computer Science Education,* 1848(1). doi.10.1068/1.4083943.

Subramaruan, P, R & Silverman, S. 2000. Validation of Score from an Instrument Assessing Students Attitudes Towards Physical Education, *Measurement in Physical Education and Exercise Science,* 4(1): 29-43.

The Organisation for Economic Cooperation Development 2015. Skills for social progress: The power of social and emotional skills, Paris, France, OECD Publishing.

Waha, B., & Davis, K. 2014. Journal of Higher Education Policy Management, *University Students' Perspectives on blended learning,* 37-44.

Wessley, O., Conor, P., Diarmuid, L., Sarahjane, B., Duncan, M, J., Donovan, B., Chambers, F., & Utesch, I. 2023. Motor competence assessment in physical education-convergent validity between fundamental movement skills and functional movement assessment in adolescents, *Physical Education and Sport Pedagogy*, 28(3): 306-319

William, D., & Leahy, S. 2015. Embedding Formative Assessment: Practical Technique for K-12 Classrooms, West Palm Beach, FL: *Learning Sciences International*.

Yueh, H, P., Lin, W., Huang, J, Y., & Sheen, H, J. 2012. Effect of student engagement on multi-media-assisted instruction, Knowledge, Movement and E-learning, An International Journal, 4(3): 347-358.

Yuping, W., Xibin, H., & Juan, Y. 2015. Revisiting the blended learning literature: Using a complex adaptive system framework, *Journal of Educational Technology and Society*, 18(2): 380-393.

Zirkel, S., Garcia, J, A., & Murphy, M, C. 2015. Experiencing sampling research methods and their potential for education research, *Educational Researcher*, 44: 7-16.

Climate Justice in Zimbabwe: An Exploration of Equity, Adaptation, and Sustainable Development

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Abstract

Climate change poses a significant and multifaceted threat to the developing nation of Zimbabwe, exacerbating existing vulnerabilities and creating a complex web of challenges. This paper examines the intricate relationship between climate change policy, governance structures, and decision-making processes within the Zimbabwean context. Through a rigorous analysis of scholarly literature, government documents, and reports from international organizations, the study explores Zimbabwe's climate change risks, the effectiveness of policy frameworks, and the critical role of inclusive governance and decision-making in building resilience. The findings reveal that Zimbabwe's limited resources, economic instability, and heavy reliance on rain-fed agriculture render it highly susceptible to the impacts of climate change. Furthermore, the research highlights governance and accountability deficits, as well as shortcomings in decision-making processes, as key barriers to the successful formulation and implementation of climate change strategies. This paper argues that addressing Zimbabwe's climate change vulnerabilities requires a holistic approach that strengthens institutional capacity, promotes innovative financing mechanisms, invests in climate-resilient agriculture, and fosters meaningful community engagement. By adopting such a comprehensive strategy, Zimbabwe can chart a path towards a more resilient and sustainable future.

Keywords:

Climate change, policy, governance, decision-making, vulnerability, resilience, adaptation, mitigation

1.0 Introduction

Climate change represents one of the most pressing challenges facing the international community in the 21st century. The Intergovernmental Panel on Climate Change (IPCC) has established the substantial human influence on global climate patterns, resulting in a range of adverse impacts, including rising temperatures, increased frequency and intensity of extreme weather events, and sea level rises (IPCC, 2022). These climate-driven changes pose grave threats to various domains of human society, jeopardizing food security, water resources, public health, and economic stability across the globe (IPCC, 2022; World Bank, 2021).

Developing nations, such as Zimbabwe, a landlocked country in Southern Africa, are particularly vulnerable to the impacts of climate change. This heightened vulnerability stems from a confluence of factors, including limited financial resources, inadequate infrastructure, and heavy reliance on climate-sensitive economic activities, such as rain-fed agriculture (World Bank, 2021). Zimbabwe's experience exemplifies the complex challenges that arise at the intersection of climate change, policy, governance, and decision-making processes within the developing world context.

Effective climate change policy, encompassing strategy development, implementation, and evaluation, is a crucial tool for nations like Zimbabwe to navigate an increasingly uncertain future. However, the successful formulation and execution of such policies hinge on two fundamental pillars: effective governance and inclusive decision-making processes (Gupta et al., 2008). Scholars have emphasized that the ability of nations to respond to the climate crisis is contingent upon the strength of their institutional frameworks, the transparency and accountability of their decision-making structures, and the extent to which local communities are engaged and empowered in the policy cycle (Agyeman et al., 2016; Ziervogel et al., 2008).

This paper provides a comprehensive examination of the climate change-related challenges and opportunities within the Zimbabwean context, exploring the intricate interplay between climate change vulnerability, policy frameworks, governance structures, and decision-making mechanisms. By drawing upon a diverse range of scholarly sources, government documents, and reports from international organizations, the study aims to contribute to the understanding of how developing

nations can navigate the complex landscape of climate change adaptation and mitigation.

2.0 Literature Review

The academic literature on climate change, policy, governance, and decision-making processes provides a robust theoretical and empirical foundation for the analysis presented in this paper. The review of scholarly sources encompasses peer-reviewed journal articles, reports from international organizations, and government documents, with a particular focus on the Zimbabwean context.

The Intergovernmental Panel on Climate Change (IPCC), the United Nations body tasked with assessing the science related to climate change, has extensively documented the substantial human influence on global climate patterns. Their comprehensive assessments have established that, anthropogenic activities, primarily the emission of greenhouse gases, have led to a significant rise in average global temperatures, increased frequency and intensity of extreme weather events, and accelerated sea level rise (IPCC, 2021). These climate change-driven alterations pose grave threats to various facets of human society, including food security, water resources, public health, and economic stability (IPCC, 2021).

Developing nations, such as Zimbabwe, are particularly vulnerable to the impacts of climate change due to their limited financial resources, inadequate infrastructure, and heavy reliance on climate-sensitive economic activities, such as rain-fed agriculture (World Bank, 2021). This heightened vulnerability can be attributed to a confluence of factors, including chronic economic instability, political unrest, and environmental degradation (Transparency International, n.d.; Moyo et al., 2014). The vulnerable position of developing countries has been well-documented in the scholarly literature, highlighting the need for tailored policy interventions and support from the international community (Ayers & Huq, 2009; Paavola, 2008).

Researchers have emphasized the critical role of effective governance and inclusive decision-making processes in the formulation and implementation of successful climate change policies (Gupta et al., 2008; Agyeman et al., 2016). Studies have shown that the ability of nations to respond to the climate crisis is contingent upon the strength of their institutional frameworks, the transparency and accountability of their decision-making structures, and the extent to which local communities are engaged

and empowered in the policy cycle (Crook & Sturla, 2014; Ziervogel et al., 2008). Ineffective governance, marked by issues such as corruption, lack of transparency, and centralized decision-making, can undermine the effectiveness of climate change policies and hinder the mobilization of resources necessary for adaptation and mitigation efforts (Lockwood, 2013; Schlosberg & Collins, 2014).

The interplay between climate change, economic instability, and social cohesion has been explored in the academic literature, particularly within the context of developing nations (Moyo et al., 2014; Eriksen & Lind, 2009). Studies have highlighted how the impacts of climate change can exacerbate existing socioeconomic vulnerabilities, leading to increased poverty, food insecurity, and social tensions, which in turn can further undermine the resilience of communities (Moyo et al., 2014; Djoudi et al., 2016). Understanding these complex linkages is crucial for the formulation of holistic and effective climate change policies.

The reviewed literature provides a comprehensive theoretical and empirical foundation for the analysis presented in this paper, emphasizing the multifaceted nature of the climate change challenge and the critical importance of governance and decision-making processes in shaping policy responses within the developing country context.

3.0 Methodology

This study employs a qualitative research design to conduct an in-depth analysis of the climate change-related challenges and opportunities facing Zimbabwe. The research approach adheres to principles of objectivity, accuracy, and responsible representation of the sources utilized.

3.1 Research Design

The research design involves a multi-pronged approach combining a comprehensive literature review, rigorous document analysis, and thematic analysis to develop a nuanced understanding of the interconnected issues within the Zimbabwean context. This approach is in line with the recommendations of qualitative research methodologists, who advocate for the use of multiple data sources and analytical techniques to enhance the depth and validity of findings (Creswell & Poth, 2018; Yin, 2017).

3.2 Literature Review

The study began with an extensive review of academic literature, including peer-reviewed journal articles, books, and book chapters, to establish a strong theoretical foundation. The review covered topics such as climate change adaptation, governance, social capital, and sustainable development, with a particular focus on the Zimbabwean context. Key sources included publications from renowned scholarly outlets, such as the Intergovernmental Panel on Climate Change (IPCC) (IPCC, 2021), the World Bank (World Bank, 2021), Transparency International (Transparency International, n.d.), and the African Development Bank (AfDB, 2020).

3.3 Document Analysis

In addition to the academic literature, the researchers conducted a careful examination of key policy frameworks and government documents pertaining to climate change in Zimbabwe. This included a thorough review of the country's National Climate Change Response Strategy (NCRS) (Government of Zimbabwe, n.d.), the draft Disaster Preparedness Bill, and other relevant policy instruments. The analysis assessed the coverage, effectiveness, and alignment of these documents with the needs and perspectives of local communities, in line with the recommendations of policy analysis scholars (Patton et al., 2015; Ritchie & Spencer, 1994).

3.4 Thematic Analysis

The researchers employed a thematic analysis approach to identify and examine recurring themes, patterns, and interconnections within the literature and policy documents. The analysis focused on four key areas: climate change vulnerabilities, policy challenges, governance issues, and decision-making processes. This approach, as advocated by Braun and Clarke (2006), enabled the researchers to develop a comprehensive understanding of the multifaceted nature of the climate change-related challenges and opportunities facing Zimbabwe.

3.5 Ethical Considerations

Throughout the research process, the study adhered to ethical principles, including the responsible use of sources, accurate representation of findings, and avoidance of bias or misrepresentation. The researchers ensured that the analysis and the presentation of the findings remained objective and truthful, contributing to the

credibility and reliability of the research, as recommended by qualitative research ethics guidelines (Creswell, 2013; Merriam & Tisdell, 2015).

The combination of a rigorous literature review, in-depth document analysis, and thematic analysis allowed the researchers to develop a comprehensive understanding of the climate change landscape in Zimbabwe, laying the foundation for a robust and evidence-based discussion of the key issues and potential solutions.

4.0 Findings

4.1 Zimbabwe's Climate Change Vulnerabilities

The analysis reveals that Zimbabwe's vulnerability to climate change stems from a confluence of factors, including limited financial resources, economic instability, and heavy reliance on climate-sensitive economic activities, particularly rain-fed agriculture (World Bank, 2021; Transparency International, n.d.). This "perfect storm" of vulnerabilities threatens the country's future prosperity and overall well-being, as evidenced by the scholarly literature (Moyo et al., 2014; Eriksen & Lind, 2009).

4.2 Limited Resource Capacity and Infrastructure Deficit

The findings indicate that Zimbabwe's financial constraints severely limit its ability to implement robust infrastructure projects and technological advancements crucial for building climate resilience (World Bank, 2021). This lack of resources has a cascading effect, hindering the implementation of effective climate change policies and community-level adaptation efforts, as highlighted in the policy analysis (Government of Zimbabwe, n.d.).

4.3 Chronic Economic Instability and Foreign Investment Constraints

The study reveals that Zimbabwe's chronic economic instability, marked by a history of hyperinflation and political unrest, discourages foreign investment and hinders the mobilization of financial resources necessary for large-scale climate change initiatives (Transparency International, n.d.; Moyo et al., 2016). This creates a vicious cycle that undermines the effectiveness of climate change policies, as discussed in the scholarly literature on the interplay between climate change, economic instability, and social cohesion (Moyo et al., 2014; Eriksen & Lind, 2009).

4.4 High Climate Sensitivity and Agricultural Dependence

The research findings highlight that Zimbabwe's heavy reliance on rain-fed agriculture renders it particularly susceptible to the impacts of climate change, such as increased droughts and erratic rainfall patterns (Moyo et al., 2014). This disruption of agricultural production can trigger a cascade of negative consequences, including food insecurity, poverty, and environmental degradation, as corroborated by the IPCC's assessment of the threats posed by climate change to various facets of human society (IPCC, 2021).

4.5 Climate Change Policy Challenges

The findings indicate that while Zimbabwe has adopted a comprehensive National Climate Change Response Strategy (NCRS), the implementation of these policies faces significant hurdles due to administrative inefficiencies and limited resources (Government of Zimbabwe, n.d.). This aligns with the scholarly literature on the critical role of effective governance and inclusive decision-making processes in the formulation and implementation of successful climate change policies (Gupta et al., 2008; Agyeman et al., 2016).

4.6 Governance and Accountability Concerns

The analysis reveals deficits in transparency, accountability, and community participation within Zimbabwe's governance structures, which hinder the effective formulation and implementation of climate change policies (Transparency International, n.d.). Weak social cohesion for environmental management further impedes collective action at the community level, as discussed in the literature on the challenges facing developing nations in addressing the climate crisis (Crook & Sturla, 2014; Ziervogel et al., 2008).

4.7 Decision-Making Processes and Inclusivity

The findings suggest that the policy cycle and decision-making processes in Zimbabwe may not adequately incorporate local knowledge and perspectives, leading to policies that do not fully address the specific needs and vulnerabilities of communities (Crook & Watson, 2005). This highlights the importance of inclusive decision-making, as emphasized by scholars examining the governance and social

dimensions of climate change adaptation and mitigation (Crook & Sturla, 2014; Ziervogel et al., 2008).

The comprehensive and multi-layered findings of this study provide a robust foundation for the discussion of potential solutions and policy recommendations to address the climate change-related challenges facing Zimbabwe.

5.0 Discussion

5.1 Strengthening Institutional Capacity and Governance

Enhancing Zimbabwe's institutional capacity and governance structures is crucial for the effective formulation and implementation of climate change policies. This involves measures such as improving administrative efficiency, increasing transparency and accountability, and empowering local communities to participate in decision-making processes (Gupta et al., 2008; Lockwood, 2013). Strengthening the institutional framework can help address the policy implementation gap and ensure that climate change initiatives are effectively coordinated and executed across different government agencies (Moser & Ekstrom, 2010; Schlosberg & Collins, 2014). Additionally, promoting inclusive and participatory governance can foster greater community ownership and support for climate change adaptation and mitigation efforts (Crook & Sturla, 2014; Ziervogel et al., 2008).

5.2 Innovative Financing Mechanisms

Bridging the resource gap and unlocking investments in climate-resilient infrastructure and technologies require the exploration of innovative financing mechanisms, such as public-private partnerships, green bonds, and targeted government incentives (AfDB, 2020; Fankhauser & Schmidt-Traub, 2011). These approaches can help mobilize the necessary financial resources while fostering an enabling environment for private sector engagement in climate-related projects (Adenle et al., 2017; Pauw, 2015). Accessing international climate finance through mechanisms like the Green Climate Fund can also be crucial for developing countries like Zimbabwe to supplement their limited domestic resources (Ayers & Huq, 2009; Ciplet et al., 2013).

5.3 Climate-Resilient Agricultural Transformation

Promoting a shift towards climate-smart agriculture, including the adoption of drought-resistant crops, water-efficient irrigation techniques, and soil conservation practices, can enhance the resilience of Zimbabwe's agricultural sector (FAO, 2018; Lipper et al., 2014). Integrating climate information services and strengthening social safety nets can further support smallholder farmers in adapting to climate variability (Lobell et al., 2008; Schlenker & Lobell, 2010). Diversifying agricultural production and exploring alternative income sources can also help mitigate the impacts of climate change on food security and rural livelihoods (Moyo et al., 2014; Niang et al., 2014).

5.4 Fostering Inclusive Decision-Making Processes

Meaningful community engagement and the incorporation of local knowledge and perspectives into the policy cycle are crucial for developing climate change strategies that effectively address the specific needs and vulnerabilities of Zimbabwean communities (Ziervogel et al., 2008; Crook & Watson, 2005). This can help ensure that policies and decision-making processes are responsive to the realities on the ground and address the concerns of marginalized groups (Crook & Sturla, 2014; IPCC, 2021). Empowering local stakeholders, including community-based organizations and traditional leaders, can enhance the legitimacy and long-term sustainability of climate change adaptation and mitigation efforts (Ayers & Huq, 2009; Paavola, 2008).

Addressing Zimbabwe's multifaceted climate change challenges will require a holistic and integrated approach that leverages the synergies between strengthened institutional capacity, innovative financing mechanisms, climate-resilient agricultural transformation, and inclusive decision-making processes. By tackling these interconnected issues, Zimbabwe can enhance its resilience, promote sustainable development, and safeguard the livelihoods and well-being of its citizens in the face of a changing climate

6.0 Conclusion

Zimbabwe's vulnerability to climate change is a complex, multifaceted challenge that necessitates a comprehensive and inclusive approach to build long-term resilience. The scholarly analysis has revealed a confluence of socioeconomic, institutional, and environmental factors that contribute to the country's heightened susceptibility to the impacts of a changing climate.

At the core of Zimbabwe's vulnerabilities are its limited financial resources, chronic economic instability, and heavy dependence on climate-sensitive economic activities, particularly rain-fed agriculture (Moyo et al., 2014; World Bank, 2021). This "perfect storm" of vulnerabilities has far-reaching implications for the country's food security, economic development, and environmental sustainability (Hallegatte et al., 2013; Lobell et al., 2008; Schlenker & Lobell, 2010).

Addressing these interconnected challenges will require a holistic strategy that tackles the root causes of Zimbabwe's vulnerability. This may involve strengthening institutional capacity and governance structures to enhance the formulation and implementation of effective climate change policies (Gupta et al., 2008; Lockwood, 2013); exploring innovative financing mechanisms to mobilize the necessary resources for climate-resilient infrastructure and technology (AfDB, 2020; Pauw, 2015); and promoting a transformation towards climate-smart agriculture to enhance the resilience of the country's primary economic sector (FAO, 2018; Lipper et al., 2014).

Importantly, the success of these interventions will hinge on the meaningful engagement and empowerment of local communities, ensuring that decision-making processes and policy formulation are inclusive and responsive to the specific needs and vulnerabilities of Zimbabwean citizens (Crook & Sturla, 2014; Ziervogel et al., 2008). This can help foster a sense of ownership and commitment to climate change adaptation and mitigation efforts, ultimately enhancing their long-term sustainability.

By addressing Zimbabwe's interconnected vulnerabilities through a comprehensive, evidence-based, and participatory approach, the country can build resilience, promote sustainable development, and safeguard the livelihoods and well-being of its citizens in the face of a changing climate. This will require a concerted effort from all stakeholders, including the government, civil society, the private sector, and the

international community, to collectively tackle the multifaceted challenges and unlock the path towards a more climate-resilient future for Zimbabwe.

References

Adenle, A. A., Manning, D. T., & Arbib, J. (2017). Climate change mitigation in developing countries: A critical assessment of the CDM and other mechanisms. The Anthropocene Review, 4(2), 103-124.

Adger, W. N. (2006). Vulnerability. Global Environmental Change, 16(3), 268-281.

AfDB. (2020). Green bonds: Unlocking private sector climate finance in Africa. African Development Bank Group.

Agyeman, J., Schlosberg, D., Craven, L., & Matthews, C. (2016). Trends and directions in environmental justice: From inequity to everyday life, community, and just sustainabilities. Annual Review of Environment and Resources, 41, 321-340.

Ayers, J. M., & Huq, S. (2009). The value of linking mitigation and adaptation: A case study of Bangladesh. Environmental Management, 43(5), 753-764.

Berrang-Ford, L., Pearce, T., & Ford, J. D. (2015). Systematic review approaches for climate change adaptation research. Regional Environmental Change, 15(5), 755-769.

Ciplet, D., Roberts, J. T., & Khan, M. (2013). The politics of international climate adaptation funding: Justice and divisions in the greenhouse. Global Environmental Politics, 13(1), 49-68.

Crook, R. C., & Sturla, S. (2014). Democracy and community-based natural resource management. African Affairs, 113(450), 1-21.

Crook, R. C., & Watson, R. (2005). Decentralization and poverty in developing countries: A review of recent research. Journal of International Development, 17(4), 535-555.

Eriksen, S. H., & Lind, J. (2009). Adaptation as a political process: Adjusting to drought and conflict in Kenya's drylands. Environmental Management, 43(5), 817-835.

Fankhauser, S., & Schmidt-Traub, G. (2011). From adaptation to climate-resilient development: The costs of climate-proofing the Millennium Development Goals in Africa. Climate and Development, 3(2), 94-113.

FAO. (2018). Climate-smart agriculture training manual. Food and Agriculture Organization of the United Nations.

Government of Zimbabwe. (n.d.). National Climate Change Response Strategy. Retrieved from [URL]

Gupta, J., Termeer, C., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., ... & Bergsma, E. (2008). The adaptive capacity wheel: A method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. Environmental Science & Policy, 11(2), 121-135.

Hallegatte, S., Bangalore, M., & Fay, M. (2013). Poverty and climate change: An analytical framework. World Bank Policy Research Working Paper, 6636.

IPCC. (2021). Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Lipper, L., Thornton, P., Campbell, B. M., Baedeker, T., Braimoh, A., Bwalya, M., ... & Torquebiau, E. F. (2014). Climate-smart agriculture for food security. Nature Climate Change, 4(12), 1068-1072.

Lockwood, M. (2013). The political sustainability of climate policy: The case of the UK Climate Change Act. Global Environmental Change, 23(5), 1339-1348.

Lobell, D. B., Burke, M. B., Tebaldi, C., Mastrandrea, M. D., Falcon, W. P., & Naylor, R. L. (2008). Prioritizing climate change adaptation needs for food security in 2030. Science, 319(5863), 607-610.

Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. Proceedings of the National Academy of Sciences, 107(51), 22026-22031.

Moyo, M., Mvumi, B. M., & Crush, J. (2014). The impact of climate change on agriculture in Zimbabwe. Journal of Sustainable Development, 7(4), 125.

Niang, I., Ruppel, O. C., Abdrabo, M. A., Essel, A., Lennard, C., Padgham, J., & Urquhart, P. (2014). Africa. In Barros, V. R., et al. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution

of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 1199-1265). Cambridge University Press.

Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. Global Environmental Change, 20(4), 550-557.

Paavola, J. (2008). Livelihoods, vulnerability and adaptation to climate change in Morogoro, Tanzania. Environmental Science & Policy, 11(7), 642-654.

Pauw, W. P. (2015). Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries. Climate Policy, 15(5), 583-603.

Schlenker, W., & Lobell, D. B. (2010). Robust negative impacts of climate change on African agriculture. Environmental Research Letters, 5(1), 014010.

Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. Wiley Interdisciplinary Reviews: Climate Change, 5(3), 359-374.

Transparency International. (n.d.). Country profile: Zimbabwe. Retrieved from [URL]

UNFCCC. (2015). Zimbabwe's Intended Nationally Determined Contribution (INDC). United Nations Framework Convention on Climate Change.

World Bank. (2021). Climate Change Adaptation Strategy for Africa. Retrieved from [URL]

Ziervogel, G., Cartwright, A., Tas, A., Adejuwon, J., Zermoglio, F., Shale, M., & Smith, B. (2008). Climate change and adaptation in African agriculture. Stockholm Environment Institute.

Role of Spiritual Accompaniment in Promoting the Holistic Development of Students in Higher Education in Zimbabwe: A Qualitative Analysis

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Abstract

This study is about the holistic development of students in the face of complex behavioural challenges that are emerging in higher education contexts. While acknowledging the feasibility of other approaches, this study analyses the role of spiritual accompaniment (SA) in promoting the holistic development of students. Whereas the study used the lens of the student development theory, multidisciplinary concepts encompassing psychology and religion, were imbued to discern how spiritual accompaniment can be employed as a supportive and transformative practice to influence students' personal growth, well-being, and academic success. The study collected qualitative data from 30 students who were enrolled in 5 universities in 3 Provinces of Zimbabwe. Their captivating experiences in higher education illumined the challenges they faced and the utility of spiritual accompaniment in mitigating some of the problems and promoting the students' holistic development. The findings shed light on the intricate and subjective role of spiritual accompaniment in fostering the holistic development of students in the context of higher education in Zimbabwe. The study contributes to the existing literature on student development and provides insights for educators, counsellors, and policymakers among other stakeholders.

Keywords: higher education, spiritual accompaniment, student, holistic development

1.0 Introduction

Students who are enrolled in colleges and universities are increasingly confronted by diverse and complex developmental issues than ever before in the history of higher education in Africa, including Zimbabwe. The rapid growth of higher education in Africa

brings students from diverse backgrounds and ages to create higher education communities in which every student is consciously or unconsciously preoccupied by the question of what kind of person they want to become, first, during their years in higher education and second after they complete their studies. Given that higher education institutions enrol students from different cultures, faiths and others who identify in other diverse ways, the challenges they face are complex and multi-layered. The influence of technological advancements, when abused, add to the challenges. Given the complex higher education environment and the increasing challenges arising from it, the human development theories that are commonly used to predict, explain and control behaviour to promote developmental outcomes among students, need to be complemented by other approaches. This has prompted this study to enquire about the role of Spiritual Accompaniment (SA) in promoting the holistic development of students in higher education. The paper provides a background that triggered the conduct of this study, a brief outline of the guiding theory, a summary of the reviewed literature, the methodology used in this study and a discussion of the key findings.

1.1 Background of the study

Educational psychology, anchored on the nature-nurture controversy, provides the traditional perspectives that explain the development of students. Whereas it is now widely accepted in the field of educational psychology that both nature and nurture play significant roles in shaping individuals, the complex developmental challenges faced by students in higher education institutions require a broader understanding that goes beyond the nature-nurture dichotomy. Following the massification of higher education, student populations in colleges and universities have diverse backgrounds, cultures, and faiths, each with their own unique identities and experiences. This diversity brings forth additional dimensions that influence students' development and well-being. For instance, some students grapple with issues related to drug and substance abuse, promiscuity and homosexuality among numerous other behavioural problems. These complex and multifaceted challenges necessitate a more comprehensive approach to understanding and supporting students' holistic development.

Sommers-Flanagan (2015) perceived that if Freud was a pessimist and Adler and Jung were optimists, humanistic psychologists were super-optimists. From a perspective in psychology, humanists have a deep belief in people's ability to develop into positive, creative, flexible, and altruistic creatures when they are not constrained by challenges that arise from their interaction with others (McLeod, 2018; Ismail & Tekke, 2015; Rogers, 1969; Maslow, 1956). This humanistic perspective is based on an unwavering belief that each human being has a natural tendency for personal growth. Carl Rogers explained this positive tendency and elaborated that;

We can say that there is in every organism, at whatever level, an underlying flow of movement toward constructive fulfilment of its inherent possibilities. human beings, too, there is a natural tendency toward a more complex and complete development. The term that has most often been used for this is the 'actualizing tendency,' and it is present in all living organisms." (Rogers, 1980, pp.117-118).

In the context of higher education students, Carl Rogers' quote highlights the underlying flow towards fulfilling their inherent potential and natural inclination for personal growth and development, motivated by their innate drive to reach their full potential through their studies. In this regard, Rogers' quote points us to the idea that students have the capacity to grow, learn, and develop in various aspects of their lives and that their development can be further cultivated through exposing them to conducive educational experiences. It implies that students should be provided with an environment that nurtures and supports their natural inclination towards growth, allowing them to explore their interests, talents, and passions.

While humanists including Carl Rogers, remind us that higher education students, like all individuals, have an underlying drive towards constructive fulfilment of their inherent possibilities, they are confronted with numerous challenges that characterise the 21st century higher education environments. Higher education students are increasingly facing numerous challenges requiring robust approaches to inculcate desirable behaviours that produce positive educational outcomes. This study notes that the impact of Spiritual Accompaniment (SA) or simply spirituality on the students' development matrix has been generally overlooked, leaving it unrepresented in their developmental agenda in particular and in educational psychology in general. This omission snubs everyday evidence that spirituality holds significant sway on the

development of personality. Spirituality arbitrates between a person's self-actualising tendency and his/her pathological predispositions. These extreme developmental aspects may hinder or promote the holistic development of students. This paper demonstrates that SA is a supportive instrument for making students more human, more sincere and genuine with their inner-selves, more coherent with their deep identity and more fraternal with other students within the walls of their institution as well as the generality of other beings in society. Hence, its incorporation into educational psychology and application in higher education cannot be overstated.

2.0 Theoretical Framework

The Student Development Theory was used in this study as the guiding theoretical framework. This theory was developed by Chickering and Reisser in 1993, who outlined seven vectors of student development, including developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity. This theory is a human development model that explains how students who are enrolled in higher education develop, taking into account their physical, biological, physiological, psychological, social and environmental factors that constitute their development (Evans, Forney, Guido & Patton, 2019). The theory suggests that students go through various stages of development throughout their higher education journey, and each vector represents a dimension of growth and transformation. Using this theory, this study demonstrates how spiritual accompaniment influences and promotes the holistic development of students, encompassing these vectors of growth as they navigate their academic, personal, and spiritual journeys.

2.1 Literature Review

Despite abundant evidence indicating the prevalence of students who are grappling with issues that can be addressed through spiritual conversations and guidance, referred to in this study as spiritual accompaniment. This practice is to a large extent, avoided in higher education primarily because it is erroneously deemed to be outside

the scope of higher education (Triana, Gloria & Castellanos, 2020). For this reason, spiritual accompaniment is rarely practiced in higher education contexts. Although the concepts of ‘spirituality’ and ‘spiritual accompaniment’ are closely linked and oftentimes used as synonyms, these concepts do not mean the same. According to Waggoner (2016), spirituality refers to an individual's personal and subjective experience of seeking meaning, purpose, and connection with something beyond themselves. Recent studies have also shown that spirituality encompasses beliefs, values, practices, and experiences that are deeply meaningful and significant to an individual's sense of identity, purpose, and well-being (Aboramadan & Dahleez, 2021; Fuertes & Dugan, 2021). On the other hand, spiritual accompaniment refers to a supportive relationship, often within a religious or spiritual context, that provides companionship and guidance to another individual on their spiritual journey (Cadge et al., 2020; Astin, Astin & Lindholm, 2011). Spiritual accompaniment can be viewed as a means through which individuals can deepen and explore their spirituality. It involves offering a safe space for reflection, exploration, and growth and may include practices such as listening, mentoring, counselling, prayer or meditation. While spirituality is a broader concept that encompasses an individual's inner experiences and beliefs, spiritual accompaniment is a specific form of support provided to individuals as they navigate their spiritual path.

Studies conducted in America by Astin et al. (2011), explored the role of colleges in enhancing students' inner lives, including their spiritual development. Their qualitative study collected data from college students from diverse backgrounds, using interviews, to determine the role of spiritual accompaniment on students' holistic development. The study found that the colleges that practiced spiritual accompaniment, significantly contributed to their students' sense of purpose, personal growth, and well-being. The key finding from this study highlights the positive influence of spiritual accompaniment on the holistic development of students in higher education. Another qualitative study by Parks and Hermes (2019), explored the role of spirituality and religiosity in college students' holistic development. Through in-depth interviews with undergraduate students, their study examined how spiritual practices, including spiritual accompaniment, influenced students' personal growth, values, and well-being. The study noted that spiritual accompaniment was supporting students'

holistic development by providing them with opportunities for self-reflection, meaning-making, and connection to a larger purpose.

In Europe, studies have also shown similar results. A study by Ziebertz and Riegel (2016) employed a mixed-methods approach that included surveys and interviews with university students, to determine the relationship between spirituality, education, and society. The study revealed a positive influence of spiritual accompaniment on students' personal growth, well-being and ethical values. Their study recommended the integration of spiritual accompaniment into higher education practices to support students in their holistic development. Elsdon and Mitchell (2019) conducted a narrative review of the literature on spiritual care in the context of European higher education. They reviewed various studies and resources related to spiritual accompaniment and its role in supporting student's growth and development. Their review acknowledged the significance of spiritual accompaniment as a means of promoting students' well-being, resilience, and sense of purpose in higher education. The review further established the importance of providing spaces for students' spiritual needs within the higher education context, because of the positive impact it plays on their overall development.

Wong and Mak (2019) conducted a study in Hong Kong to examine the role of spirituality in promoting the well-being of university students. Their study employed surveys and interviews to establish the relationship between spirituality, well-being, and various aspects of students' lives in the university settings. The study revealed that spiritual accompaniment, including practices such as meditation and mindfulness, positively influenced students' psychological well-being, life satisfaction, and resilience. This study by Wong and Mak (2019) aligns with the results of a study conducted in Vietnam by Truong and Huynh (2018). Truong and Huynh's study employed interviews and focus groups to investigate students' experiences with spiritual accompaniment and its effects on their personal growth, values, and well-being. The study found that spiritual accompaniment provided a supportive environment for students to explore their spirituality, nurture their values, and develop a sense of purpose.

The studies conducted in Hong Kong and Vietnam provide valuable insights into how spiritual accompaniment practices, such as meditation, mindfulness, and supportive

environments, can positively influence students' well-being, personal growth, values, and sense of purpose. However, the same findings cannot be applied wholesomely in the context of students in higher education in Zimbabwe due to issues of contextual validity. However, the present study builds upon these prior findings and provides further insights into how spiritual accompaniment supports the holistic development of students in the specific context of higher education in Zimbabwe.

In the African context, few studies focusing on issues of spirituality and student development were conducted. One such study was conducted by Ntshangase (2018), to investigate the role of spirituality in student development using South African higher education institutions. The study revealed that spirituality provided students with a sense of belonging, emotional support, and personal growth. The study further noted that spirituality also played a role in helping students navigate challenges and cultivate resilience. While not a specific study on spiritual accompaniment in higher education, Mbiti's (2018) book provides valuable insights into African religions and their philosophical underpinnings. The book explores the spiritual beliefs, practices, and values that shape the lives of individuals in Africa. Understanding the cultural and spiritual context of Africa is crucial in examining the role of spiritual accompaniment in promoting students' holistic development in higher education within the African context. Chivore and Chivore (2018) conducted a study in Zimbabwe that investigated the role of spirituality in enhancing students' academic performance. Their study used mixed methods to examine the relationship between spiritual practices and students' academic outcomes. The study revealed that students who actively engaged in spiritual practices demonstrated better academic performance, higher motivation and increased resilience among other positive developmental outcomes.

Several knowledge gaps were identified in the reviewed literature, which provide a justification for conducting this current study. The first gap relates to the limited contextual validity. Most of the reviewed studies were conducted in various higher education contexts including in the United States, Europe, Hong Kong, Vietnam and South Africa. While findings from these studies shed light on the transformative impact of spirituality and spiritual accompaniment on students' inner lives, sense of purpose, personal growth, values, and well-being, they cannot be directly applied to the specific context of higher education in Zimbabwe. This study addressed this gap by focusing on the role of spiritual accompaniment in the holistic development, specifically within

the higher education context in Zimbabwe. The second knowledge gap concerns the vital issue of cultural relevance. The majority of the reviewed literature focuses on studies conducted in Western and Asian contexts, whose cultures differ significantly from those of Zimbabwe. For this reason, there was a need to understand the role of spiritual accompaniment within the African context, taking into account cultural, social, and spiritual beliefs that shape the lives of students in African higher education. This study addressed this gap by focusing on the role of spiritual accompaniment on student development in the context of higher education in Zimbabwe, taking into account the country's unique cultural realities. This study addressed the identified gaps and contributed to the existing body of literature by providing a more contextually relevant understanding of the role of spiritual accompaniment in promoting students' holistic development within the unique higher education context of Zimbabwe.

3.0 Methodology

This qualitative study adopted a phenomenological research philosophy, an interpretive phenomenological approach and a multiple case study research design to analyse the role of spiritual accompaniment in promoting the holistic development of higher education students. Using the lens of phenomenology, this study managed to explore students' subjective experiences and their lived realities during their tenure in higher education. As elaborated by several scholars (Zahavi, 2021; van Manen & van Manen, 2021; Halling, 2021; Dangal & Joshi, 2020), phenomenology seeks to uncover the essence of a studied phenomenon and help the researcher to understand how it is experienced by those who are affected by it. Thus, through phenomenological principles, this study delved into the students' experiences of spiritual accompaniment and its impact on their holistic development. The study employed an interpretive phenomenological approach as articulated by Cuthbertson, Robb and Blair (2020), to interpret and understand the participating students' experiences and realities in the context of higher education. The study used in-depth interviews and focus groups to collect data from students who have engaged in spiritual accompaniment in higher education settings. Through these interviews, participants shared their personal narratives, reflections, and perceptions regarding how spiritual accompaniment influenced their holistic development. Thematic analysis, involving identifying recurring themes within the data as explained by various scholars (Flick, 2022; Dangal & Joshi, 2020; Braun & Clarke, 2019), was used to provide rich and detailed insights into the

role of spiritual accompaniment in promoting the holistic development of students in higher education. Member checking, peer review, triangulation of data collection methods and use of multiple sources of data, were employed to enhance the trustworthiness and credibility of the study results.

4.0 Discussion of Findings

The landscape of higher education has become increasingly diverse, complex, and fast-paced, presenting students with both opportunities and challenges. As elaborated by Triana et al. (2020), the evolution of higher education, brought with it a myriad of challenges that are faced by students, significantly impacting their developmental trajectories. This study has found that students in universities and colleges in Zimbabwe were not immune to this problem. Acknowledging the utility of spirituality as an approach to addressing some of the emerging challenges affecting the development of students in higher education, many higher education institutions in Zimbabwe provide the services of the chaplaincy to their students.

This study found that at Great Zimbabwe University (GZU), the university Chaplaincy is manned by a religious leader who offers general spiritual support and guidance to staff and students. The chaplaincy department upholds the spiritual values of various faiths, promoting freedom of worship at the university. The chaplaincy coordinates the various student groups that wish to fellowship at the University's campuses. In addition to its coordination function, the chaplaincy department at GZU hosts interdenominational services that are held on Sundays at Mashava and the Main campus, ensuring that the services of the chaplaincy are open to the entire University. The Midlands State University (MSU) has a department of chaplaincy just like GZU. Their department provided pastoral services by ministering to the spiritual needs of the entire MSU community including students. Similarly, the Women's University in Africa's (WUA) chaplaincy department offered a number of religious and spiritual matters, including planning and coordinating on and off-campus spiritual and religious programmes that foster the development of co-curricular programs that assist students in the integration of Christian faith with their respective academic disciplines. Some of the services offered by WUA's Department of Chaplaincy include assisting students with welfare issues, prayers, consolation, counseling during times of grief and guidance on issues related to their spiritual, moral and personal development.

University of Zimbabwe's (UZ) chaplain office provides pastoral care and serves as a spiritual resource to the entire UZ community. Among the key functions are the provision of free counselling for staff and students who need it, including those who are feeling low, depressed, suicidal and those who are extremely burdened with life among other stressful events. Zimbabwe Ezekiel Guti University (ZEGU), also offers robust chaplaincy services, as articulated in its mission statement which reads;

The Chaplaincy serves to minister effectively to the spiritual and social needs of the university community by accompanying individual staff members and their families and students in their faith journeys towards spiritual maturity and fulfilment of their God-ordained purpose, through its unique role of providing bible based spiritual guidance, counselling, offering prayers, the teaching of the word of God, and other pastoral care systems to the ZEGU community.

The 5 universities mentioned above provided chaplaincy services to their staff and students. Data revealed that chaplaincy services were offered at all 5 universities that were focused on by this study as mentioned above. However, the participants' perspectives indicate that these services were offered within the historical framework of ecumenical, a concept that entails the promotion of cooperation and unity among Christians. While the ecumenical dialogue, the search for unity and freedom of worship among the students across the 5 universities, was a giant step towards the full spiritual accompaniment practice, this generalised approach was not sufficiently addressing a range of problems faced by students in higher education. With the exception of ZEGU which specifically mentions the word 'accompanying' in its chaplaincy services' mission statement, the other four universities provided the usual general pastoral services as implied in their mission statements and more importantly as revealed by participants drawn from those institutions. According to the participants, SA was not as robust in practice as portrayed in their universities' chaplaincy service statements. The participant indicated that the only thriving spiritual accompaniment in their institutions was found among fellow students, especially those who came from strong Christian backgrounds.

Four major themes emerged from the study data and these are discussed in the paragraphs that follow, highlighting the key findings that arose. The names used in the discussion are pseudo-names in line with ethical considerations relating to the

anonymisation of data for the protection of the participants' real identities, as elaborated by various scholars (Flick, 2022; Urquhart, 2022; Dangal & Joshi, 2020; Denzin & Lincolin, 2018; Creswell & Creswell, 2017).

Theme 1: Students' Perceptions of Spiritual Accompaniment

This theme delves into the experiences and perceptions of students who have engaged in spiritual accompaniment in higher education and those who were not engaged in this practice. Data under this theme reveals mixed perceptions regarding the benefits, challenges, and overall impact of spiritual accompaniment on the participants, and how they related it to their personal experiences in higher developmental outcomes. While participants held diverse perceptions regarding the role of spiritual accompaniment, they all acknowledged the importance of attaining holistic development and personal growth beyond academic achievement. Students who were engaged in spiritual accompaniment practices viewed them as a means to explore their inner selves, enabling them to find purpose, meaning, develop a deeper understanding of their values and beliefs, and helping them to navigate the complexities of the multiple challenges they faced in their higher education journeys. For these perceived benefits, participants appreciated spiritual accompaniment for providing them with the tools and support system they needed to thrive academically and personally, fostering resilience, self-efficacy and confidence in the face of numerous challenges including economic hardships faced by students in higher education. Tanatswa, one of the participants who was engaged in spiritual accompaniment, stated that;

I never realised how much spiritual accompaniment could impact my psychological well-being until I tried it. I belong to a prayer group here on campus and we pray for divine protection against all forms of adversity we face as students. In our prayer group, we guide and support each other to navigate the challenges we face here at college. This has helped me develop a deeper sense of direction, resilience and acceptance of things that I cannot change. I feel more resilient and motivated to overcome obstacles and succeed in my academic aspirations.

The benefits of spiritual accompaniment as explained by Tanatswa in her verbatim quote above, were echoed by yet another participant Tino, who explained that;

University life is not just about academic success but also about nurturing our psychological, moral, emotional and spiritual selves. Engaging in spiritual activities with others plays a vital role in our holistic development as students. Consistent prayers with my friends have provided me with coping mechanisms and a sense of peace during stressful times. I feel more connected to myself and others, and it has positively influenced my relationships and overall happiness. I can concentrate on my studies despite the numerous challenges I face as a student at this institution.

As highlighted in the two extracts above, some students in the participating universities acknowledged that activities related to spirituality were positively influencing their overall well-being and development. These students were involved in several modes of spiritual accompaniment including prayer groups, interdenominational prayers and fellowship in church congregations within the proximity of their campuses. However, the study noted that the student's understanding of the ministry of chaplaincy is very limited and shallow. There was a lot of misconception among university students, with regards to the services that the chaplaincy department can provide in relation to spiritual accompaniment. For example, some students perceived a chaplain from a Catholic background as a minister who caters only to the spiritual needs of those practicing Catholicism. Such perceptions were evidently witnessed in spiritual practices such as masses where only Catholic students attended masses while non-Catholics excluded themselves intentionally. By so doing, non-Catholic students tended to overlook the theology that the kingdom of God does not exclude but rather caters for everyone despite the student's varied backgrounds and religious affiliations. These perceptions were evident across universities. The trend was that only students who shared the same religious affiliations with the university chaplain were actively seeking and receiving adequate spiritual accompaniment while the rest lacked access to such services despite the evident behavioral benefits exhibited by those who were being accompanied.

Theme 2: Nurturing Spiritual Well-being of Students in Higher Education

This theme was built on data relating to the role of spiritual accompaniment in fostering spiritual well-being among university students. Data under this theme highlight ways in which spiritual accompaniment provides a supportive and nurturing space for

students to explore their spirituality, develop a sense of meaning and purpose, and cultivate a deeper connection with themselves and the world around them. This holistic effect provided a sound basis for academic achievement among university students, most of whom belong to the adolescence and young adulthood age range that are characterised by numerous developmental challenges that require proper mentoring of the whole person. This study noted that adding adolescence and young adulthood developmental challenges on top of the pressures of university life, exacerbated by a challenging economic environment, created a situation that required spiritual accompaniment to help the students to cope. As elaborated by various scholars (Fuertes & Dugan, 2021; Parks & Hermes, 2019; Astin et al., 2011), spiritual accompaniment provides students with tools and practices to explore their inner selves, leading to greater self-awareness and a fulfilling life. This study argues that this self-exploration can help university students gain clarity about their values, beliefs, and purpose, fostering personal growth and a stronger foundation for the development of a sense of identity leading to positive academic performance.

We further argue that spiritual accompaniment is a broad concept that covers many aspects of higher education institutions. Several techniques such as mental health awareness activities, confessions, recollection days, scripture union, spiritual talks, masses and sermons, can be utilised as tools for spiritual accompaniment. These tools can complement each other and if utilised properly they can enhance the spiritual development of students. However, many institutions of higher learning tend to focus more on common issues that do not deepen the spirituality of their learners. For example, the issue of drug and substance abuse has become so popular among students in higher education, such that it takes precedence over their spiritual development, a problem that negatively affects their overall academic outcomes. Our finding confirms several past research findings. Linda (2015) noted the need for formal education on spiritual care in nursing, highlighting the importance of support and the establishment of a conducive learning environment. Wang et al. (2023) and Kiessling (2010) both underscored the influence of peer and mentoring relationships, as well as the role of institutional agents in shaping students' spiritual beliefs and development. Rykkje et al. (2022) and Gilder (2011) also found that the integration of spiritual development in higher education settings was a vital component in the holistic development of students. Thus, our findings from data under this theme augment the

above cited earlier findings that concur that spiritual accompaniment, when provided in a supportive and structured manner, can significantly contribute to students' holistic development in higher education.

Theme 3: Integration of Spiritual Accompaniment and Academic Development in the Context of Higher Education

Data under this third theme relates to the intersection between spiritual accompaniment and academic development. Analysis of data under this theme illuminated the intricacies of how spiritual accompaniment was enhancing the students' academic experiences in higher education institutions. The analysis also revealed the complex ways in which spiritual accompaniment was supporting students in integrating their spiritual beliefs, values, and ethical perspectives into their academic pursuits. Furthermore, analysis of data under this theme also sheds light on how spiritual accompaniment can contribute to students' critical thinking, ethical decision-making, and engagement with their academic disciplines.

The study found that the relationship between spiritual accompaniment and academic development was like that of fish and water. This finding suggests that there should be a formidable balance between spiritual life and academic life. However, we observed that institutions of higher learning were more focused on the students' academic aspects while overlooking their spiritual side. This was creating an imbalance between the two. This was so despite the evidence showing that students who were exposed to spiritual accompaniment were balancing academic demands with other dimensions of their university life because they believed in the existence of a higher power, whom they believed could steer them to achieve their academic goals despite the challenges they encountered during their studies. For instance, the study found that students who understood the relevance of morality that derives from their interface with spiritual accompaniment were not exposed to the jaws of drug abuse and other immoral practices. Their overall personalities were nourished and regulated spiritually, making them resilient in the face of numerous adversities they encountered during their time as university students.

Theme 4: Influence of Spiritual Accompaniment on Students' Development

This theme focused on how spiritual accompaniment was influencing the holistic development of students in higher education institutions. Data under this theme

showed that spiritual accompaniment was enhancing the students' personal growth and self-reflection. This enabled them to explore their values, beliefs, and purpose. It was apparent that spiritual accompaniment was playing a critical role towards the holistic development of students who interfaced with it. This was based on the rationale that spiritual accompaniment enabled the concerned students to engage in self-reflection, ensuring that they aligned their moral decisions with the educational goals they came to pursue in their respective universities. The study observed that through spiritual accompaniment, students were stimulated to become critical and more focused in undertaking their studies. The study further observed that students who were not spiritually accompanied were at high risk of peer pressure and other negative mechanisations that arise from a lack of self-reflection, self-consciousness and a deep-seated sense of purpose.

5.0 Implications

The influence of spiritual accompaniment on the holistic development of students is profound. These two aspects are inextricably connected, they work hand in hand and the overall development of students suffers in the absence of spiritual accompaniment. Therefore, the findings of this study hold profound implications for the improvement of the practice of student affairs by institutions of higher education. Firstly, this study points to the need for universities to strengthen their chaplaincy departments to levels that are proportionate to the spiritual accompaniment of their student body. It highlights the vital role that spiritual accompaniment plays in student affairs, a practice that encompasses the management and provision of various services, programs, and resources that contribute to the holistic development of university students. The study demonstrated that spiritual accompaniment is a powerful tool that can be used to support students to overcome challenges and thrive during their university journey. The implication hinges on this study's finding that the challenges students face during their university life extend beyond academics, hence, the need for institutions to provide a comprehensive support system including spiritual accompaniment, in order to address the students' holistic development. As noted by this study, the transformative effects of spiritual accompaniment on students' self-awareness, resilience, and overall well-being, have the potential to equip them with a wealth of experiences, rooted in the inner core of a fulfilling university life, an aspect which can drive holistic development.

On the other hand, the negative implications associated with the provision of comprehensive spiritual accompaniment services cannot be overlooked. The first challenge pertains to abuse of power by personnel in the chaplaincy departments. This may occur when personnel providing spiritual accompaniment take advantage of the trust reposed on them by students seeking their services. For instance, a student seeking spiritual accompaniment with regards to challenges relating to relationship affairs, may end up being a victim in the process. The need to maintain professionalism by personnel offering these services cannot be overemphasised.

While the positive impact of spiritual accompaniment on the holistic development of students was clearly illuminated through findings of this study, this vital tool can be subject to abuse by some students who may hold the motive of manipulating a good system, to cover up for their immoral behaviours. Therefore, there is need to ensure that spiritual accompaniers maintain the highest standard of professionalism to ensure that their practice is not defiled by acts of misconduct.

Lastly, incompetence can pose another challenge especially among those providing such services. For instance, some personnel in the chaplaincy department may not be competent to handle certain issues because of inadequate training or lack of specialised training. Universities can address this challenge by ensuring that their chaplaincy departments are composed of experts from different behavioural fields of practice.

6.0 Recommendations

The following recommendations are based on the study findings;

The Government should acknowledge the importance of spiritual accompaniment in the holistic development of university students and allocate resources and support to universities to strengthen their chaplaincy departments.

Universities should establish guidelines and standards for spiritual accompaniment services to ensure professionalism and prevent abuses and strengthen their chaplaincy departments to adequately support the spiritual accompaniment needs of the student body that promote their holistic development.

Universities should ensure that personnel in their chaplaincy department receive appropriate training and have expertise in handling diverse issues faced by students and be capacitated to identify cases for referral.

University chaplaincy departments should develop clear and proper structures that sustain the needs of students while maintaining the highest standards of professionalism to prevent abuse of power and misconduct.

Chaplaincy departments should collaborate with experts from different behavioural fields to ensure the chaplaincy department can effectively handle a wide range of student challenges.

University students should seek spiritual accompaniment services with genuine intentions aimed at promoting their holistic development during their university journey.

References

Aboramadan, M., & Dahleez, K. A. (2021). Workplace spirituality and job performance in higher education. Journal of Management, Spirituality & Religion, 18(2), 128-150.

Astin, A. W., Astin, H. S., & Lindholm, J. A. (2011). Cultivating the Spirit: How College Can Enhance Students' Inner Lives. Jossey-Bass.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. Journal of Qualitative Research in Sport, Exercise and Health, 11(4), 589-597.

Cadge, W., Stroud, I. E., Palmer, P. K., Fitchett, G., Haythorn, T., & Clevenger, C. (2020). Training chaplains and spiritual caregivers: The emergence and growth of chaplaincy programs in theological education. Pastoral Psychology, 69, 187-208.

Carcary, M. (2020). The research audit trail: methodological guidance for application in practice. Electronic Journal of Business Research Methods, 18(2), 166-177.

Chickering, A. W., & Reisser, L. (1993). Education and identity (2nd ed.). NY: Jossey-Bass.

Chivore, B. Z., & Chivore, T. F. (2018). The Role of Spirituality in Enhancing Students' Academic Performance: A Case of Undergraduate Students at a University in Zimbabwe. Journal of Psychology in Africa, 28(6), 494-499.

Creswell, J.W., & Creswell, J.D. (2017). Research designs: Qualitative, quantitative and mixed methods approaches. NY: Sage Publications.

Cuthbertson, L.M., Robb, Y.A., & Blair, S. (2020). Theory and application of research principles and philosophical underpinning for a study utilising interpretative phenomenological analysis. Journal of Radiography, 26(2), 94-204.

Dangal, M., & Joshi, R. (2020). Hermeneutic phenomenology: Essence in educational research. . Open Journal for Studies in philosophy, 4(1).

Denzin, N.K., & Lincolin, Y.S. (2018). The Sage Handbook of Qualitative Research. NY: Sage.

Dodgson, J. (2017). About Research: Qualitative Methodologies. Journal of Human Lactation, 33(2).

Elsdon, B., & Mitchell, R. (2019). Spiritual Care in Higher Education: A Narrative Review of the Literature. Journal of Pastoral Care & Counseling, 73(4), 220-230.

Evans, N.J., Forney, D.S., Guido, F.M., & Patton, L.D. (2019). A Guide to Student Development Theories in Higher Education. London: Wiley.

Flick, U. (2022). An introduction to qualitative research. New York: Sage.

Fuertes, A., & Dugan, K. (2021). Spirituality through the lens of students in higher education. Religions, 12(11), 924.

Fusch, P., Fusch, G.E., & Ness, L.R. (2018). Denzin's paradigm shift: Revisiting triangulation in qualitative research. Journal of Social Change, 1(2), 10.

Halling, S. (2021). Phenomenology as fidelity to phenomena: Moving beyond the Van Manen, Smith, and Zahavi debate. Educational Publishing Foundation, 49(2), 342.

Harding, J. (2019). Qualitative data analysis: From start to finish. London: Sage.

Ismail, N. A.H., & Tekke, M. (2015). Rediscovering Rogers' Self theory and personality. Journal of Educational, Health and Community Psychology, 4(3), 143-150.

Jackson, A.Y., & Mazzei, L.A. (2022). Thinking with Theory in Qualitative Research (Second Edition ed.). New York: Routledge.

Maslow, A. H. (1956). Self-actualising people: A study of psychological health. In C. Moustakas (Ed.), The self: Explorations in personal growth (pp. 160-194). New York: Harper & Row.

Maxwell, J. (2021). The importance of qualitative research for investigating causation. Qualitative Psychology, 8(3), 378.

Mbiti, J. S. (2015). African Religions and Philosophy. Heinemann.

McLeod, S. (2018). Maslow's Hierarchy of Needs. New York: Sage.

Merriam, S.B., & Tisdell, E.J. (2015). Qualitative research: A guide to design and implementation. London: John Wiley & Sons.

Ntshangase, S. (2018). The Role of Spirituality in Student Development: An Exploratory Study in a South African Higher Education Institution. Journal of Psychology in Africa, 28(6), 489-493.

Parks, S. D., & Hermes, M. (2019). The Role of Spirituality and Religiosity in College Students' Holistic Development. Journal of College and Character, 20(4), 279-294.

Rogers, C. (1969). Freedom to Learn. Ohio: Merrill.

Rogers, C. (1980). A way of being. Boston: Houghton Mifflin Company.

Rykkje, L., Sovik, M. B., Ross, L., McSherry, W., Cone, P., & Giske, T. (2022). Educational interventions and strategies for spiritual care in nursing and healthcare students and staff: A scoping review. Journal of Clinical Nursing , 31(11), 1440-1464.

Sommers-Flanagan, J. R. (2015). Counselling and Psychotherapy Theories in Context and Practice. Skills, Strategies, and Techniques. New Jersey: JOhn Wiley & Sons.

Triana, C., Gloria, A. M., & Castellanos, J. (2020). Cultivating Success for Latinx Undergraduates: Integrating Cultural Spirituality within Higher Education . About Campus, 24(6), 4-9.

Truong, Q. T., & Huynh, V. T. (2018). The Role of Spiritual Accompaniment in the Holistic Development of Vietnamese University Students. Journal of College and Character, 19(3), 185-194.

Urquhart, C. (2022). Grounded theory for qualitative research: A practical guide. New York: Sage.

van Manen, M. & van Manen, M. (2021). Doing phenomelogical research and writing . Qualitative Health Resaerch, 31(6), 1069-1082.

Waggoner, M. D. (2016). Spirituality and contemporary higher education. Journal of College and Character, 17(3), 147-156.

Wang, D. C., Reed, A., Greggo, S., Bowersox, L., Drennan, A., Strawn, B., ... & Hill, P. C. (2023). Spiritual formation in theological education: A multi-case exploration on seminaries and student development. Christian Education Journal, 20(1), 65-86.

Wong, P. T., & Mak, W. W. (2019). Examining the Role of Spirituality in Promoting Well-being of University Students in Hong Kong. International Journal of Psychology, 54(6), 772-779.

Yin, R. (2018). Research design: Qualitative, quantitative, and mixed methods approaches. Sage.

Zahavi, D. (2021). Applied phenomenology: Why it is safe to ignore the epoche. Continental Philosophy Review, 54(2), 259-273.

Ziebertz, H. G., & Riegel, U. (2016). Spirituality, Education and Society: An Empirical Approach. Waxmann Verlag.

Deconstruction and consumption of traditionally designed pottery vessels in contemporary Zimbabwe, with Special Reference to Apostolic Christian Church Sects

Andrew Madziwanzira

Abstract

This qualitative study interrogates the consumption of traditional pottery vessels within the Apostolic Christian church sects in Zimbabwe. The study argues that with the sudden increase in African-initiated churches, especially the Vapositori (Apostolic) sects a noticeable increase in the distribution and consumption of pottery products as worshipping accessories has been observed. It also posits that while there has not been a major change in the form and shapes of the vessels, there has been a significant shift in the end use of the vessels to include tourist souvenirs and symbolic prayer accessories. It is thus observed that to a larger extent, the symbolic function has been found to have motivated the continued existence of pottery-making in Zimbabwe. We argue that traditional pottery-making has become a major source of symbolic substance with the capacity to be used as prayer accessories with economic potential.

Keywords: Pottery vessels, material culture, continuity and change, symbolic, commodification

1.0 Introduction

One of the most known abundant raw materials that is used to produce utility objects since ancient times is clay. (Ellert, 1992; Arthur, 2013, Lindahl & Matenga, 1995, Flower, 2008). Pottery has provided archaeological evidence of cultures and the technological development of life in the past. In Zimbabwe, the use of clay to create pottery vessels is still prevalent although acculturation has significantly revolutionized its use and consumption. Compounded by the impact of globalization the use of traditional clay vessels in Zimbabwean and similarly in most parts of sub-Saharan

Africa has shifted to industrial goods (Arthur, 2013) which are durable and compatible with modern energy sources. Despite societal transformations, the resilience of the practice in Africa is worth investigating. There should be serious research to account for the continued existence of pottery-making practices in societies where this art still exists. Notably, several studies in the sub-Saharan region focus on technological aspects as they link archaeological findings with current research practices and this is evidenced by studies done in western and eastern Africa including some parts of southern Africa (Gosselain, 2000; Gossealin, 1992; Gosselain, 1999; Weyessa, 2010; Arthur 2013). Regardless of the pottery vessel's cultural significance, African sculptural forms tend to receive more attention as art where documentation reveals this artistic genre as the most authentic source of African identity (Fowowe, 1984). In line with this argument, the writers take cognisant of the fact that pottery-making practices are denigrated to craft status despite being endowed with cultural tradition that defines the past of many societies through pot design, surface decorations, and symbolism associated with production and function. Notwithstanding the situation recent ethnographic studies reveal that pottery-making is endowed with symbolism which enables the artifacts to communicate through generations, (Nangendo, 1984). Pottery vessels carry material culture qualities and therefore act as social agents; the ability of the artefact to interact with humanity. Reip (2019) states that while ceramic vessels serve utility functions within social boundaries, they also act as agents for social interaction especially where they define individual and group cultural preferences. In a study of the use of artifacts for religious purposes among the Johane Masowe Chishanu yeNyenyedzi, Musoni, Machingura and Mamvuto, (2020) observe that African traditional clay pots have assumed a new role in their religious beliefs. The clay pots now serve as agencies for prayer in fulfilling spiritual needs. The use of pottery vessels as accessories for prayer illustrates the critical symbolic function inculcated in African traditional material culture. While this study focuses on the use of traditional artifacts in indigenous religious practices in general the study however does very little to reveal the meaning embedded in graphic symbols inscribed inside pottery-artefacts used by some apostolic faith sects. This paper in essence deconstructs the symbolic function of selected pottery vessels being used as prayer accessories by apostolic faith churches in Zimbabwe with particular attention to the graphic signs inscribed inside some pottery artefacts. The study also focuses on the woman potter as a designer and creator of the symbolic signs inscribed inside pottery vessels. The

interpretation of meaning contained in the graphic signs inscribed inside the clay vessels was done through interviews with sect leaders. This study brings to light the shift in symbolic function and significance of pottery vessels to the woman potter. Through the study of pottery vessels produced in Shumba village in Chinamhora district in Mashonaland East Province, the study interrogates the construct of continuity and change of pottery-making traditions by analysing the symbolic function of the clay pottery vessels. Observed too are lived experiences of women potters in this contemporary cultural environment that is influenced by Western education, technology, social change, and rapid economic development. In revealing the role of the potter and that of the members of the apostolic sects the study investigated the symbolic significance of the pottery vessels in understanding continuity and change. The study was guided by the following objectives:

1. To explore factors that contribute to continuity and change in traditional pottery practices in Shumba village Chinamhora, Zimbabwe;
2. To establish the role of women potters in pottery production; and
3. To deconstruct indigenous pottery forms, patterns, and symbolism entrenched within the consumption of traditional pottery.

1.1 African pottery making

While archaeologists tend to regard pottery making as means to trace life in the past in ancient civilization through material culture, ethno-archaeologists on the other hand have contributed significantly to providing much-needed literature on factors contributing to the continued existence of pottery vessels in sub-Saharan Africa through the woman potter. Pottery-making has been observed to be a significant craft and an active practice in studies on several sub-Saharan African regions including among others Zulu potters in South Africa, (Olalere, 2019; Flower, 2010), the Yoruba in South western Nigeria (Busari & Odetoyinbo, 2021; Shado, Kashim & Fatuysi, 2020) the Manaledi potters of Botswana (Thebe, 2016), Ethiopia (Wayessa, 2020) including Ghana (Abaka-Attah, Asante-Kyei & Addae, 2019; Nortey & Asiamoaso, 2019). This somewhat confirms its relevance within the corpus of tangible and intangible heritage assets. In the word of Olalere (2019), pottery-making is regarded as a tangible asset and therefore requires continued preservation although a decline has been noted in some communities (Wayessa, 2020) and endangered as well

notably in Ethiopia and Uganda (Kayamba & Kwesiga, 2016). Despite notable strides to document through research the current developments within pottery-making communities in some parts of sub-Saharan Africa, very few research activities have been noted in Zimbabwe. For example, in South Africa studies on Zulu traditional pottery in KwaZulu-Natal fundamentally identify the preservation of pottery-making through cultural traditions such as beer brewing, rituals, and ceremonies (Fowler 2008, Fowler 2011, Flower 2006; Armstrong 2010). Elsewhere Weyessa (2010) and Arthur (2013) found out that among the Jimma and Gamo respectively in Ethiopia pottery-making persists as a result of utilitarian and non-utilitarian values. These examples reveal the significance of pottery-making particularly the role of women in the preservation of pottery traditions as an indigenous technology.

Besides that, globalization factors such as Western education, cultures, etc., have influenced the propagation of the continued existence and use of pottery, and the economic benefits realized through pottery-making practices are now a prerogative of most studies. Fowler (2010) gives a repertoire of Zulu pottery which narrates how Msinga women benefit from the continued demand for pottery vessels. According to Gombe (2002) among the Gisu in Uganda, pottery-making is regarded as a worthwhile activity sustaining livelihoods in rural communities. Studies in pottery-making tend to agree that within various social boundaries, pot design, and decorations are ascribed to symbolic meaning and function depending also on gender roles. In sub-Saharan Africa, the pot is a valuable asset as it is used in the preparation of traditional meals and beer and to a large extent rituals, for example, the Zulu pottery. This dimension situates pottery-making as endowed with abundant belief systems where taboos are meant to preserve this ancient tradition and assure its continued existence. Quoting Gosselain, ‘from a technical point of view breaching a taboo may affect the three stages of the manufacturing process’ (1999: 209). This statement points towards the preservation of pottery-making practices from clay extraction to production processes. The aspects of prohibitions provide an essential spiritual presence that guides the entire process of pottery-making that makes pots sacred.

While elsewhere studies have established the factors proliferating the continued existence of pottery vessels (Thebe, 2016; Busari & Odetonyibo, 2021; Wayessa, 2020)) very little has been observed on the continued existence emanating from changes in symbolism and an approach that situates this practice to be more

commercialized in approach. The phenomenon prevailing in Chinamhora district in Zimbabwe illustrates that the demand has the potential to foster the preservation of pottery-making and offer livelihood to the women potters.

2.0 Theoretical Framework

The concept of continuity and change could be well understood in the field of anthropology in the study of material culture. Although used together in diverse fields it is important to unpack the terms separately to understand their application in explaining the social dynamics, and artifacts from the past to the present world of material culture. Continuity refers to staying the same comparatively for a long period. An artefact may remain the same technologically in form and style from generation to generation. Continuity is existing in the same form while maintaining the same value (Bill, 2014) and further argues that continuity may also resides in the mind rather than in materials per se. This statement holds continuity in the form and nature of the objects remain the same including their symbolism. However, according to Smith et al, (1982), continuity is the process of uniting the past, present, and future. Therefore, where continuity is concerned traditions recur from one generation to the other over time. However, the form of nature and the symbolic function of objects may change as human adapts to diverse cultural environments. Ndiiri (1997), is of the view that continuity in coastal pottery in Kenya is an example of cultural continuity. Although there are elements of continuity in pottery making it is faced with its problems, emanating especially from radical changes propagated by technological advancement. Change in this sense refers to the failure of traditional objects to adapt to changes in new cultural environments brought about by modern technological advancement. Change in this sense are transformations including alterations that occur while being driven by factors including among others, technology, social interactions, and economic development and can impact society negatively or positively. Culture has been observed to be dynamic as it responds to and absorbs new ideas (Sibani, 2018) into society as the old is replaced with new ways of life. As part of material culture pottery-making traditions are susceptible to change. Material change has been observed to be positive or negative and is believed to be perceived from different perspectives by some scholars (Sanchez, 2018). Where it is positive it

may carry with it the continuity of some traditions while negatively it may result in the demise of traditional practices. This phenomenon is prevalent in some parts of Africa where pottery-making practices are declining and some extent ceasing completely. However, for this study pottery vessels have aspects resisting change while existing in an environment faced with radical technological and societal transformations. These resisting aspects have fostered continuity in which the past, present, and future of pottery-making practices and consumption can be traced. Pottery-making in Domboshava Shumba Ward 3 homesteads is a clear demonstration of cultural continuity adapting to environmental changes brought about by influences of globalization.

3.0 The study sites

The study was situated in Shumba Villages' Ward 3 homesteads in Chinamhora District in Mashonaland East Province of Zimbabwe. While the study results focus on the functions of pottery vessels the study's initial stage was to begin at the source in Shumba village Banga and Marimo homesteads. The study area was chosen for the widespread number of women potters in the communities with an established processing rate of pottery vessels averaging 10-20 pieces per day. The study area was identified through a pottery trader frequenting Chinhoyi urban for markets. These communities are commonly identified with market gardening despite also engaging in growing seasonal crops. However, the major focus of this study is pottery making. Other than subsistent farming interviewed women in these villages stated that they are preoccupied with pottery-making an activity that has become more full-time due to demand. Since the study sought to establish the symbolism enshrined in the inscribed symbols inside pottery vessels the study also engaged members of the apostolic faith churches in Chinhoyi urban located 115 kilometres from north-west of Harare who are consumers of these clay vessels.

4.0 Methodology

The research employed a qualitative study approach using open-ended interview questions which allowed the principal researcher to engage the women potters in Banga and Marimo village homesteads in explaining their experiences, beliefs, and behaviours in their cultural context. Understanding the phenomenon from the

participants' perspective and their settings is grounded in qualitative studies where it is possible to use a small number of individuals. No wonder it is from these settings that phenomenological methods which inherently "seek the opinions and subjective accounts and interpretation of participants" (Gray 2009, p. 28), were put to use in this study. Qualitative methods were used to further our understanding of the symbolic nature of pottery vessels and how they are manufactured and distributed. The participants consisted of potters who included widowed and married women belonging to diverse age groups. Purposive sampling of (14) participants was done following case study research approaches where participants are chosen according to the quality of information they carry, (Denscombe, 2010; Williman, 2006; Gravetter & Forzano, 2009). To add variety and diversity to practicing potters, snowballing procedures were also employed as a sampling strategy. A lead informant assisted the principal researcher to identify the homesteads of participants. In total several visits were done to conduct interviews and focus group discussions (FDGs).

The observations, interviews, and FGDs sought to explore forms and designs on pottery, identify factors contributing to its continued existence and explain the insights of women potters in Banga and Marimo homesteads on designs they inscribe inside clay vessels. The first stage of the research was done through interviews to get the demographic information of the potters. The second stage involved the use of open-ended questions to establish potter experiences and their understanding of pottery vessel production, uses, and symbolism and was conducted at potters' homesteads. The third stage involved two FGDs as a strategy to triangulate data collected through individual interviews and these were conducted at the headman's homestead. The women were also observed creating vessels and inscribing symbols inside the vessels. The fourth stage of the research shifted from Chinamhora district to Chinhoyi urban in Mashonaland West where the marketing and consumption of the artefacts was observed. The meanings of decorations on pots were established through purposively selected six participants who claimed to be spiritual healers and members from the *Mapositori* (Apostolic sects) through the use of open-ended questions. The data was analyzed alongside the dictates of thematic analysis of data collected from interview sessions while semiotic analysis was used as a lens to reveal the structure and design of pottery vessels. The connotations of the signifiers (pottery vessels) and the symbols inscribed inside them assist in establishing their meaning within the

apostolic sect religious practices. The semiotic lens also assisted in establishing the denotative value of the clay vessels being the basic meaning of the symbols inscribed inside the vessels, for example, the cross, representing Christianity.

5.0 Results and discussion

Drawing from the interviews, focus group discussions, and observations this study observed that there has been an increase in pottery making in Chinamhora where it has become a full-time activity. The demographic information was collected to understand the appropriateness of the respondents in participating in the research. The fourteen respondents interviewed indicated their commitment to the practice. The women potters reported that traditional uses of vessels are still prevalent. The demand has been encouraged by the sudden surge for traditional vessels being used as religious accessories by the members of the apostolic sects. Revealed is the mass production of these vessels pushed by high demand for the products. From the focus group discussions, participants revealed that they are not spiritually connected to the clay vessels while creating and inscribing symbols inside these vessels. However, they admitted that they work under instruction through directives from the traders who supply customers in towns such as Chinhoyi Urban. The research exposed significant changes in design from traditional chevron patterns to a sign system with religious connotations. These signs are inscribed inside the vessels rather than outside surfaces signifying uniqueness in aesthetic terms. Potters have also mastered the skills of inscribing the symbols inside the vessels showing an individualistic style.

5.1 Demographic data of participants

Table 1: Key attributes of the participants

Participant	Sex	Age	Pottery-making experience (years)	Full/Part-time	Religion	Level of Education
R01	F	40-44	8	PT	Christianity-Apostolic faith	Secondary
R02	F	35-39	12	FT	Christianity	Secondary
R03	F	25-29	3	PT	Christianity-Apostolic faith	Primary
R04	F	25-29	3	FT	Christianity	Secondary
R05	F	40-44	4	FT	Christianity	Secondary
R06	F	60+	15	PT	Christianity	Secondary
R07	F	55-59	11	FT	Christianity	Primary
R08	F	55-59	18	FT	Christianity	Standard 2
R09	F	30-34	11	FT	Christianity	Secondary
R10	F	30-34	4	FT	Christianity	Secondary
R11	F	20-24	3	FT	Christianity	Secondary
R12	F	20-24	8	FT	Christianity	Secondary
R13	F	50-54	21	FT	Christianity	Primary
R14	F	25-29	7	FT	Christianity	Secondary

Table 1 illustrates through these age groups that the practice is no longer a preserve for the elderly as culturally and previously believed (Wayessa, 2020). The adage that potting skills are passed on from generation to generation can be safely dismissed in this regard. This is evidenced by the data in Table. 1 showing various age ranges of interviewed respondents. As a result, it is no longer a preserve for the elderly but a

survival skill for everyone, among them the young who in some instances have trained older women. Young women falling in the 20-24 age group are full-time experienced potters. The number of years of experience indicated in column two shows the diversity in the period potters have been engaged in the activity. This is an indicator that the recruitment of potters is ongoing illustrating continuity. The level of education too is very high since most of the participants have at least attended up to Ordinary Level. The potters are all Christians although not from the apostolic sects.

5.2 Pottery-making practice and the mitigation of poverty

The study found out that traditional pottery has become a supplement in generating income in place of subsistence farming which used to be the only source of livelihood. This outcome vindicates Burke (1992, p.199), who states that 'goods produced in pre-capitalist society are transformed into commodities' and where he further observes that 'the nature of their exchange, their usage, and their aesthetics are transformed as a result.' This account provides important information on commoditization as villagers produce many pots for a ready market. This reveals that the commodification of pottery making is a phenomenon currently prevailing in Shumba village. Cited as the major driver is the prevalence of poverty in this area as among all the 14 interviewees it was identified as a key motivator for taking up pottery making. Thus, potters are bent on exploiting an emerging demand from the apostolic sects who use clay pots for prayers known as (*masowe*). This was noted in FGD 1 where participants agree that the advent of apostolic sects in post-colonial Zimbabwe has increased the demand for pots which enticed many to take up pottery making. It was noted that as a result of this demand pots production has become a complete full-time activity as shown in Figure 1 as out of the 14 interviewees three indicated that they work on a part-time basis. Thus, this development can be viewed as a significant phenomenon contributing to the alleviation of poverty thus improving the livelihoods of villagers (Thebe, 2016; Mbonile & Huale, 2020).

This research also observed that despite an increase in potters and the competition amongst each other, one of the interviewed potters reported that "I am excited by the orders that I get, especially the big orders as I had never anticipated this when I was introduced to pottery." This statement further illustrates that they supply to traders who

then resell these consumers. However, potters bemoan this approach to doing their business as it deprives them of the prospects to maximize their income. Although there are unfair trade imbalances pottery making is becoming a significant income generation source not only for potters but traders as well.

5.3 Pottery making and societal cohesion

Also significant is the fact that cooperation among potters has drastically increased as these potters network lessening the burden of marketing, sourcing raw materials, and to some extent cooperating during production. However, very few women admitted to working together during this process. Such development on its own is a clear indication of how traditional pottery-making is contributing to social cohesion. This is also explained by how the experienced potters are willing to impart pottery skills freely to anyone willing to earn a living out of this trade, as some of the respondents conceded that traditional pottery-making is for everyone to exploit. It was noted that among the respondents there is a tendency of contributing towards the mobilization of funds to hire vehicles to ferry products to the market since individually this is expensive. This is however not the only situation potters get to work together but in several other demanding challenges such as clay quarrying and the collection of firewood.

5.4 Pot adornment and symbolism

Another significant observation being presented by this study is the shift in symbolism in pot usage. Familiar usage of pots includes domestic and traditional rituals, as some elderly respondents indicated that they use pots for cooking special meals. They all agreed that pots are now being produced to act as agencies for *minamato*, the vernacular term for (prayers). This has prompted potters to concentrate on particular pot designs and shapes. Commonly produced pots are *mbiya* (small bowl), *mazambara* (larger version of *mbiya* bowl), and *gate* (similar to the beer pot). Generally, the design of these types of pots is similar to the traditional forms. *Mbiya* is the smallest bowl which has sizes that vary slightly in depth and diameter depending on the preferences of individual potters. *Mazambara* is another type of bowl popular with potters which is relatively grander in size than mbiya although its shape and form

are quite (similar to the beer pot). The *gate* is also a common vessel. These three types of pots are not used for anything else other than *minamato* (prayers). Potters are thriving on exploiting their demand hence they have increased the production of clay pots through the traditional way.

Interestingly besides form and design, these pots are decorated in a very unusual fashion where the inside center of the pot is adorned while the outside is left undecorated. The decorations are signs done according to client specifications usually as prescribed by the religious leader as an accessory for prayer deliverance. All the participants agreed that they design pots on the inside with shapes in the form of *nyenyedzi* (star), *mwedzi* (moon), *mazino* (teeth), *muchinjikwa* (cross), *dare* (court), *chanja* (palm), and *tsoka* (foot). The different symbols illustrate the nature of prayer sought by a client. All the respondents could not reveal the meaning of these symbols despite being master craftspersons of these pots.

The star is usually designed to show radians numbering 3, 5, 7, 6, 9, and 12. The moon is shown as a quarter; the teeth are usually put on the rim of the pot, and the cross is an addition (plus) sign. These designs are symbolically represented without strict adherence to realism. Processes of pottery making have not changed much as potters use the same traditional pinch and coil methods and techniques to produce pottery. However, a fascinating difference concerning decoration is the ability of the potters to produce an individualistic representation of pots despite similarities in shape and form. This is made possible by the process of molding designs during the forming stages of the pot rather than after pot construction as the scratching of chevrons. The design consequently becomes an integral and inseparable element of the pots. One interesting design noted is the palm and foot which are traced from a hand and foot of a child in the case of *mbiya* and for *mazambara* is that they work from a template of their own feet and hands.

The use of clay pots is guided by a strong spiritual engagement which is supported by fasting usually for seven days. A person seeking deliverance is asked to bring a clay pot with a symbol describing the nature of prayers that will save them.

The *mbiya* and *mazambara* vessels emerged to be the most widely used vessels since they are used to contain a variety of symbols. The outline of the meanings of pottery

vessels with different symbols as given by the interviewed spiritual healers supporting women potters' interpretations is as follows,

The palm inside a vessel represents requests offered to receive prayers to increase fortune and luck.

The *muchinjikwa* (cross) represents those converted to believing, prayers are done to stabilize the souls of the newly converts, and they are asked to bring a clay pot with a cross inside.

The *mwedzi* (moon) symbolises the time when evil spirits manifest in humans therefore an attack is cleansed by prayers represented in a *mbiya* (small bowl) with a quarter moon inside the pot.

The *nyeredzi* (star) is light. It's a guiding light. There is usually a miss understanding as some have 5, 6, 9, and 12 spikes on a star, as highlighted by the prophet. The star symbols are being abused by unscrupulous spiritual healers. *Dare* (court) represent leaders in spirits in the spirit world such as Samson for power, Joshua for Holy Spirit, and Moses for leader. If one seeks power they are requested to bring a bowl with this symbol of a court.

A *gate* (traditional beer pot) is used for prayers to cleanse those who are mentally ill. It is not decorated at all. An affected person is cleansed with water from this pot with three stones inside representing power, and Holy Spirit. The pot is usually kept at the *kirawa* (a sacred place designed for prayers)

Fig 1: Pot designs with symbolic decorations

a) Palm

b) Cross

e) Moon

d) Star

e) Star

f) Star

g) Star

h) Dare

i) Gate

6.0 Conclusions

This study established that although there was a decline in pottery consumption during the colonial era, a sudden demand for the artefact surfaced as a result of emerging churches that use the pot as prayer accessories. This has increased the number of

potters who in turn have improved their livelihoods through trading in these pottery wares. Besides the potters, traders in marketplaces where these pots are sold also benefit. The research demonstrates the aspect of continuity and change in pottery-making practices in Zimbabwe as revealed from the pottery vessels being produced by Banga and Marimo homesteads in Shumba village in Domboshava. Continuity is within the technological processes while change is in the symbolic use of the clay vessels. The study found that the potters are operating in an organized commercial way hence the clay pot as a traditional artefact has been successfully commodified. This is supported by a participant who admitted, "If this trend continues, it means pottery making will hopefully sustain us for quite a while." This development is quite significant as it has resuscitated a traditional technology that was once threatened with collapse. However, noted through this study is a shift in the symbolism of pottery vessels that indicates an important function during healing prayer sessions. The decorations bear symbolic information never used during traditional rituals representing a significant change in traditional pottery-making. The study established unique ways of decorating traditional pots, through the use of contemporary religious practices where surface design appears inside the vessels. However, the use of symbols as decoration and their functionality has increased the aesthetic value of the clay vessels demonstrating the continuity of the traditional practice. This entails that the traditional practice adapted to cultural changes emanating from global influences. Sadly, the study noted that prohibitions and taboos associated with pottery-making clay have been abandoned as a result of subjugating the authenticity of traditional pottery-making.

References

Adebimpe, O. 2015. Pottery production, an entrepreneurship perspective for job creation and poverty alleviation. A case study of Dada pottery, Okelele, Ilorin, Kwara State, Nigeria. *Journal of Economics and Sustainable Development*, *6*(2): 172-178.

Abaka-Attah, M., Opoku-Bonsu, K., & Gbologah, L. 2017. Feminism as a Model in Pottery: Contribution of Women to the Preservation of Pottery Heritage. *International Journal of Sciences: Basic and Applied Research* (IJSBAR), 23(3):1-12.

Akpomuvie, O., B., (2011), 'The role of traditional skills and techniques in the development of modern science and technology in Africa', *International Journal of Humanities and Social Science, 1(13),* 178-186., http://www.ijhssnet.com/journal/index/367 (Accessed 03 November 2018.

Arthur, J.W, 2013, Transforming clay: 'Gamo caste, gender, and pottery of South western Ethiopia' *African Study Monographs*, Suppl. 46: 5–25.

Burke, T. 1992. Nyamarira that I loved: Commoditisation, consumption and the social history of soap in Zimbabwe. In *Collected Seminar Papers. Institute of Commonwealth Studies*. 42: 195-216.

Busari, D., & Odetoyinbo, O. 2021. Home grown; home inspired: the resilience of traditional hand-built pottery production in Ìjàyè, Abéòkúta, Southwest Nigeria. *African Identities*. 1-17

Cohen, E. 1988. Authenticity and Commoditization in Tourism, *Annals & of Tourism Research,* (15): 371-386. http://www.sciencedirect.com/science/article/pii/016073838890028X. (Accessed: 20 August 2018)

Denscombe, M. 2010. *The Good Research Guide: for small-scale social research projects.* (4th ed). Maidenhead: McGraw-Hill Open University Press.

Fowowe, M. 1984. "Yoruba Traditional Art: Symbolism and Interpretation." *Marilyn Zurmuehlin Working Papers in Art Education,* (3), 25-29.

Fowler, K. D. 2008. Zulu pottery production in the lower Thukela basin, KwaZulu-Natal, South Africa. *Southern African Humanities*, *20*(2): 477-511.

Flower, K. D., 2006. Classification and Collapse: The Ethno-history of Zulu ceramic use, *Southern African Humanities,* 18 (2): 93–117.

Gbenda, J., S., Tapping the indigenous knowledge systems for sustainable development in Nigeria, www.thembosdev.com/publications.htm. (Accessed 18 June 2014)

Gizaw, B., (2003), 'Blending of traditional and modern technologies through science', *International Conference on African Development Archives.* http://scholarworks.wmich.edu/africancenter_icad. (Accessed online: 13 June 14)

Gombe, C., 2002. Indigenous pottery as economic empowerment in Uganda. *International Journal of Art & Design Education*, 21, 1. http://onlinelibrary.wiley.com/doi/10.1111/1468-5949.00295/. (Accessed: 13/06/2020)

Gosselain, O., P., 2000. 'Materializing identities: An African perspective', *Journal of Archaeological Method and Theory*, 7(3), 187-217. http://www.springer.com/social+sciences/anthropology. (Accessed: 01 November 2014)

Gosselain, O., P., 1999. In pots we trust the processing of clay and symbols in sub-Saharan Africa *Journal of Material Culture* 4(2), 205–230 [1359-1835(199907) 4(2) 205–230;008710]. (Accessed: 23 August 2023).

Gosselain, O., P. 1992. 'Technology and Style: Potters and Pottery among Bafia of Cameroon', *Man, New Series, 27(3)*, 559-586. http://www.jstor.org/stable/2803929 (Accessed: 03 July 2019).

Gravetter, F., J., and Forzano, L., B., 2009. *Research Methods for Behavioural Sciences*, Wodworth: Belmont.

Gray, D., E., 2009. *Doing Research in the Real World*, Sage Publications Limited Oliver's Yard: London.

Gukas, H. J. 2011. Decline of traditional pottery practice among the afizere of Naton-Doss in Plateau state of Nigeria. *ATBU Journal of Environmental Technology*. *4*(1); 69-78.

Kayamba, W., K., and Kwesiga, P., 2016. The role of pottery production in development: A case study of the Ankole region in Western Uganda. *Net Journal of Social Sciences Vol. 4(4), pp. 81-90.* http://www.netjournals.org/z_NJSS_16_023.html

Jones, S., 2010. 'Negotiating authentic objects and authentic selves beyond the deconstruction of authenticity', *Journal of Material Culture,* 15(2), 181-*203,* http://mcu.sagepub.com/content/15/2/181. (Accessed: viewed 30 August 2014)

Lindahl, A., and Pikirayi, I., 2010. Ceramics and change: an overview of pottery production techniques in northern South Africa and eastern Zimbabwe during the first and second millennium AD, *Archaeological and Anthropological Sciences*. 2(3),133-149

Mbonile, M., & Haulle, E. (2020). Pottery and Poverty Reduction among Kisi Households in Ludewa District, Tanzania. *Journal of the Geographical Association of Tanzania.* 48-76. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3551095. (Accessed: 24 August 2023).

Ndiiri, W. (1996). Continuity and Change: A case study of the ceramic technology of the Kenya coast. *Journal of Eastern African Research & Development*, 231-237.

Nengendo, S., 1996. Pottery taboos and symbolism in Bukusu society. Western Kenya. *African study monographs,* 17(2): 69-84.

Nortey, S., & Bodjawah, E. K. 2022. Ghanaian Clay Practices: a Rethinking. *Journal of Art, Design, Art Education & Cultural Studies*. *7*(1), 18-29.

Olalere, F. E. 2019. Effects of ecological process on indigenous pottery as a cultural tourism product: A case of Zulu pottery. 8(5): 1-11. http//: www.ajhtl.com: accessed (24 August 2023)

Smith, M. E., Dann, G., Delfendahl, B., Francillon, G., Greenwood, D. J., Hughes, D. T... & Zamora, M. D. (1982). The Process of Sociocultural Continuity [and Comments and Replies]. *Current Anthropology*, *23*(2): 127-142.

Sibani, C. M. 2018. Impact of Western culture on traditional African society: Problems and prospects. *Journal of Religion and Human Relations*. *10*(1): 56-72.

Thebe, P. C. 2016. 'Our Past, Our Present, and Most Importantly of All, Our Future' The Role of Potters in Botswana. *Botswana Notes and Records*, *48*, 338-350.

Wayessa, B. 2020. 'No one remains living in the past': the dynamics of pottery technological styles in southwestern Ethiopia. *Azania: Archaeological Research in Africa*, *56*(1): 115-139.

Effective Leadership as a Panacea for Climate Change Mitigation and Adaptation in Africa

Paul Nemashakwe

Abstract

Addressing climate change has become a top priority for the entire world because without urgent action, calamitous consequences are inevitable. This will result in humans paying a heavy price in the areas of food security, water resources and public health. Although Africa as a continent contributes less to global emissions, evidence shows that it is one of the most severely affected regions of the world. It is predicted that climate change will produce both social and political problems for Africa, weakening states and societies in the process. This will inevitably threaten economic and political stability on the continent. Having said this, what is disheartening is that the current climate change agenda continues to fail Africa. Time has come for the continent to engender the leadership necessary to deal with climate change in a sustainable way. Although research has shown leadership as a significant component in the mitigation of and adaptation to climate change, effective leadership continues to be elusive in Africa, more than six decades after the first country gained political independence. Despite the continent being blessed with both human and natural resources in abundance, it has unfortunately been plagued for a long time with poor, and ineffective leadership. There is need for transformational leaders who will advocate for substantial change in existing institutional and societal values in terms of ecologically sustainable practices. Mitigating climate change in Africa requires courageous leaders who are able to make decisions that maybe inconvenient in the short term. Innovative leaders should recognise and vigorously promote a shift from fossil fuels to renewable energy sources.

Key words: Africa; Climate Change; Effective leadership; Leadership.

1.1 Introduction

Addressing climate change has become a top priority for the entire world because without urgent action, calamitous consequences such as heat waves, floods, droughts and a substantial loss of biodiversity are inevitable (Raimi, Vivien & Oluwatoyin, 2021). Humans will pay a heavy price in the areas of food security, water resources and public health. Although climate change is a global threat, evidence shows that Africa will be the one severely affected. According to the Mo Ibrahim Foundation (2022) the ten most climate vulnerable countries in the world are found in Africa. These countries account for 20.1 percent of the continent's population.

Climate change will produce both social and political problems for Africa, weakening states and societies in the process (Tadesse, 2010). This may resultantly threaten economic and political stability on the continent. However, what is disheartening is that the current climate agenda continues to fail Africa (Mo Ibrahim Foundation, 2022). As such, Africa needs to urgently put its house in order and engender the leadership necessary to deal with climate change in a sustainable way. The following is a conceptual discussion which situates effective leadership as a panacea for climate change mitigation and adaptation in Africa. The discussion will proceed as follows; firstly, climate change and its effect of the continent of Africa will be discussed. This will be followed by a discussion of leadership in Africa. Finally, the paper will present leadership as a necessary tool for dealing with climate change in Africa.

1.2 Climate Change and its effect on Africa

Climate change has been categorised as the 21st century's leading human and environmental crisis (Tadesse, 2010). It is complex and poses significant threats to the environment, society and the global economy (Mirzabaev, 2023). Climate change has been caused by both human (anthropogenic) and natural causes (Tiamiyu & Salman, 2021; Christian, 2012). Human activities such as the burning of fossil fuels and deforestation are the key drivers of climate change (Shivanna, 2022). It is estimated that climate change will result in the loss of up to a third of the world's plant and animal species (Tadesse, 2010). Its effects are evident through extreme weather patterns and rising global temperatures (Shivanna, 2022). "The accumulation of greenhouse gases in the Earth's atmosphere traps heat and disrupts the natural balance, leading to a rise in global temperatures" (Moleka, 2023, p. 1).

The sea level has significantly risen due to the indiscriminate melting of the arctic ice cap. The world has been gradually experiencing extreme weather conditions resulting in several species of animals and plants becoming extinct (Christian, 2012). The continent of Africa has not been spared; It has been grappling with rising sea levels, changing rainfall patterns, higher temperatures and increased climate variability, all due to climate change (Tadesse, 2010). Temperatures have been increasing faster in Africa than the global average and projections are that they will continue to do so during the rest of the 21st century (Mo Ibrahim Foundation, 2022).

Although Africa contributes the least to the world's environmental challenges, it is the most vulnerable (Walker, 2022). The continent has accounted for only 3.3 percent of global emissions between 1960 and 2020 (Mo Ibrahim Foundation, 2022). This is in contrast with continents such as Asia, Europe and North America which have accounted for over eight times the carbon of Africa individually. Of all the world regions, Africa is the one most affected by droughts and the second most affected by floods (ibid). These climate change effects have become frequent relegating many people into extreme poverty.

One sector in Africa that is influenced and highly dependent on climate change is the water resource sector (Tadesse, 2010). Due to insufficient and unreliable rainfall, a number of African countries are experiencing water stress. As the population of Africa is expected to increase to approximately 1.5 billion by 2050 (ibid), the demand for water is also expected to increase significantly against a depressed supply constrained by climate change. Agriculture which is a source of livelihood for approximately three-quarters of people in Africa is rain fed. Protracted and severe droughts, floods and loss of arable land as a result of desertification and soil erosion will have devastating effects on the continent and its people.

Climate change is projected to relegate approximately 600 million people into malnutrition by 2080 (UNDP, 2008) and it is an open secret that the majority of them will be in Africa. The world has begun to experience skyrocketing food prices which are negatively affecting mainly the vulnerable and the poor and throwing many especially in Africa into severe hardship. The continent also faces the challenge of balancing access to energy and climate protection. The largest energy gap globally is

found in Africa. Over 600 million people in Africa still lack access to electricity (Mo Ibrahim Foundation, 2022).

There exists a connection between climate change and conflict (Tadesse, 2010). Climate change has been categorised as a threat impacting human security in a substantial way especially in the developing nations (Lyons Jr., Kulkarni & Dutil, 2021). As indispensable resources such as water and food continue to be threatened by climate change especially in fragile states, the majority of which are found in Africa, their scarcity can serve as an antecedent to conflict. There is also danger that terrorists may exploit the scarcity of these valuable resources and unleash terror on communities through physical destruction of water infrastructure, chemical contamination and cyber-attack.

It is not in dispute that Africa as a continent has been bearing the brunt of these consequences with many people suffering increased poverty, water scarcity and food insecurity. If urgent steps are not taken, the continent will continue to be severely affected, reversing some of the developmental gains that had been achieved and throwing many people into abject poverty and insecurity. The continent is in need of effective leadership across both sectors and governance levels (Torney, 2019). Moleka (2023) is of the view that transformative leadership is necessary to mitigate the causes of climate change and adapt to its consequences.

1.3 Leadership in Africa

The development of any society is dependent on the nature of its leadership (Solomon, Okolie, Nwamuo, Ifeanyi, Ogbonnaya, Anyanwu & Okezie, 2023). Good and effective leadership is a prerequisite for the progressive and common good of any society. This is succinctly captured by the popular saying that “the rise and fall of any society is largely dependent on leadership”. Although Africa has been largely blessed with both human and natural resources in abundance, it has been for a long time plagued by a calamity of poor, selfish and ineffective leadership.

With over six decades since the first African nation gained political independence, effective leadership continues to be elusive with a few exceptions (Nemashakwe, 2021). Negative labels such as corruptocracies, chaosocracies and terrorocracies continue to be attached to the continent signaling failed leadership (Van Wyk, 2007). Leadership has been singled out as one of the greatest obstacles impeding

development and exacerbating poverty on the continent (Moghalu, 2017; Poncian & Mgaya, 2015; Ebegbulem, 2012). The continent wallows in poverty today because her leaders have made a terrible decision of choosing poverty over development (Mills, 2011).

Leadership involves directing and influencing people towards a desired path (Solomon et al., 2023). It encompasses persuading followers to set aside their selfish interests in support of the collective good (Hogan & Kaiser, 2005). However, this is problematic in Africa where the majority of the leaders are selfish and self-centered. Their attempts to convince others to set aside their selfish quests for the common good will only be met with contempt. The quagmire of ineffective leadership rampant on the continent should not be blamed solely on the leaders but followers should also shoulder part of the blame since they are indifferent when it comes to holding their leaders accountable (Poncian & Mgaya, 2015).

Tiamiyu & Salman (2021) argues that the majority of human beings are not visionary and are in the habit of making decisions based on present considerations without considering future circumstances. This is why they need leaders who should lead them to where they should be as opposed to where they want to be. Although humans on average are aware of the fact that their continued usage of fossil fuel energy make greenhouse gases to be trapped in the atmosphere with devastating climate change effects, they lack any appetite to change their lifestyle actions because of present gratification and economic reasons. This is the reason why visionary leadership is necessary to show the majority where they should be for the common good. Leaders should have the ability to coordinate followers effectively resulting in the realisation of the common good (Njoku, 2019).

The development of Africa has been persistently affected by poor leadership (Solomon et al., 2023). For a long time, the continent has gained fame as a poster child of underdevelopment, poverty, insecurity and crisis. Unlike other continents, Africa has dismally failed to lift herself and her citizens because of leadership deficiencies (Nemashakwe, 2021). Ravallion & Chen (2004) believe that sub-Saharan Africa is the only region that has become poorer in the last generation. Leaders continue to shy away from making tough and difficult decisions which benefit the continent

(Nemashakwe, 2021). This is despite the trumpeting of the 'African solutions to Africa's problems' mantra.

The majority of political leaders in Africa are involved one way or another in massive corruption and misappropriation of funds (Mbah, 2013). They are heavily caught up in the culture of plunder and power intoxication. The majority of men and women who have presided over the affairs of the continent since the dawn of independence more than six decades ago have plundered their motherland more than they have built it (ibid). Through endemic corruption, clientelism, power politics and patronage, African leaders have been on the forefront of destroying the continent, competing with one another to make Africa a dark continent. This has negatively affected the development of the continent and resultantly the mitigation of crises such as climate change and the Covid-19 pandemic.

Research has shown leadership as a significant component in the mitigation of and adaptation to climate change (Benulic, Kropf, Linner & Wibeck, 2021). In order to tackle climate change in Africa, there is need for comprehensive societal transformation aimed at making society different from what it is today (Linner & Wibeck, 2019). Research has also shown that achieving such transformation requires collaborations that have never been seen before between government, business, non-state actors and communities (Kuenkel, 2019).

Leaders are agents of change who are important for climate change mitigation and adaptation. Effective leaders prioritise long-term sustainability over short term benefits (Chanda & Chitondo, 2024). The fact that the world is bedevilled with numerous socio-economic challenges, the majority of which are a direct result of greed, Nicolaides & Duho (2019) are of the view that organisations and nations are in need of strong leaders who are ethical and great supporters of ethical conduct and practice. However, many African countries lack ethical and visionary leaders (Chanda & Chitondo, 2024). As such, this deficit in leadership in Africa is negatively affecting efforts to curtail climate change (Tiamiyu & Salman, 2021). The next section will situate leadership as a necessary tool for dealing with climate change.

1.4 Leadership as a necessary tool for dealing with climate change in Africa

Climate change is a collective action problem which calls for numerous actors to join forces to attain a common goal. Its complexity mostly pronounced in Africa calls for a

more fluid and dynamic leadership approach, combining different leader types and leadership models (Nhamo, 2009). The continent is in need of more transformational leaders in order to combat the scourge of climate change. These are leaders who have the capacity to bring about change (Auriacombe & Jarbandhan, 2015). These leaders are expected to advocate for substantial change in existing institutional and societal values in terms of ecologically sustainable practices. They will inspire others with a vision and promote innovation in environmentally friendly products and technology.

Transformational leaders should establish long-term sustainable environmental vision for their organisations and society. Portugal & Yukl cited in Egri and Herman (2000, p. 576) identified transformational leadership actions necessary for environmental leadership as “articulating an appealing vision with environmental actions, changing perceptions about environmental issues, and taking symbolic actions to demonstrate personal commitment to environmental issues”.

Mitigating climate change in Africa requires courageous leaders who are able to make decisions that may be inconvenient in the short run (Benulic et al., 2021). Although the continent contributes the least to the causes of climate change, it is the most vulnerable. This requires leaders who are courageous and demand action not just rhetoric from industrialised nations and her leaders. They should also be able to prioritise and make sound decisions in instances where public support may be lacking.

There is need for leadership that not only understands but cherishes the value of collective action to achieve economic progress and societal well-being (Adams, Heijltjes, Jack, Marjoribanks & Powell, 2011). African leaders need to cooperate with multiple stakeholders inside and outside the continent in order to mitigate the deadly effects of climate change. The continent critically needs enablers who are able to bring diverse parties to the table and create the necessary conditions for interaction (Meijerink, Stiller, Carina, Keskitalo, Scholten, Smits & van Lamoen, 2014). These leaders should go beyond connecting people and ideas but recognising and exploiting opportunities to generate financial resources necessary for climate change adaptation.

The collaboration involving innovative leaders, academics, businesses and government entities in Masdar City, Abu Dhabi created an ecosystem of innovation which promoted sustainable practices and technologies (Lau, 2012). This resulted in innovative solutions such as the extensive use of solar energy, energy-efficient

buildings and all-inclusive waste management system being implemented resulting in a momentous reduction in greenhouse gas emissions (Manghnani & Bajaj, 2014). Climate change mitigation requires leaders who have the capacity and willingness to challenge traditional boundaries and foster new methods of cross organisational relationships and partnerships (Adams et al., 2011).

Time has come for innovative leaders to drive sustainable solutions and create a transformative impact on climate change (Moleka, 2023). Africa at the present moment requires visionary, creative and forward-thinking leaders with a deep comprehension of the interrelated nature of climate change and its implications in all the sectors. These individuals should rise above traditional models and go beyond conventional thinking to propose innovative ways of mitigating and adapting to climate change. They should inspire and empower followers and institutions to challenge traditional assumptions, think critically and adopt novel and sustainable practices (Fry & Egel, 2021).

Innovative leaders will recognise and vigorously promote a shift from fossil fuels to renewable energy sources (Moleka, 2023). The continent is in need of men and women who develop pathways for the acceptance of clean energy technologies and lead initiatives to increase the generation capacity of clean energy. It is the responsibility of leaders to champion policies that support renewable energy. Leaders in Costa Rica collaborated with private sector entities to transition the country's energy sector to renewable sources such as wind, solar and hydroelectric power. Araya (2016) reported that Costa Rica generates nearly 100 percent of its electricity from renewable sources mainly because of her visionary leadership.

In Africa, Morocco's visionary leadership spearheaded the country's transition from fossil fuels towards clean energy by investing massively in solar and wind power, resulting in renewable energy generation capacity being enhanced and greenhouse gas emissions being reduced (Ryser, 2019). This noble initiative did not only mitigate climate change but also availed opportunities for job creation and economic growth in the renewable energy sector. With visionary leadership the whole of Africa may gradually transition towards renewable energy sources. The continent possesses 30 percent of the global mineral reserves which will be critical to renewable and low carbon technologies (Mo Ibrahim Foundation, 2022). Morocco's successes in wind and solar energy may be replicated across the continent taking into consideration the

amount of sunlight that the continent receives as compared to other continents and the fact that Africa is only currently utilising 0.01 percent of its wind power potential (ibid). What is only needed is effective leadership backed by hardwork to make the dream a reality.

However, while achieving net-zero emissions is a noble global goal, the debate should not happen in isolation, but should balance net-zero emission with Africa's access to energy and energy security. Although Africa accounts for 17 percent of the world's population, on the other hand, it only accounts for 5.9 percent of the world's energy supply (Mo Ibrahim Foundation, 2022). Over 600 million people in Africa still lack access to electricity in Africa (ibid). People residing in Africa's rural areas do not even understand net-zero because they do not even have access to electricity. Those who lack electricity will continue to use sources they consider to be cheaper such as coal, the burning of wood and defecation of animals irrespective of their effect on the climate (Tiamiyu & Salman, 2021).

Climate change has demonstrated devastating effects on both people and the environment. As such, leaders should cultivate the values of universalism and benevolence (Auriacombe & Jarbandhan, 2015). Leaders who espouse the value of universalism show a high concern for the welfare of both people and the environment. Benevolent leaders deeply care for other people. With these values in mind, rather than using resources for selfish ends, African leaders across the board must channel resources in ways that motivate communities to take actions that mitigate climate change. The world is in great need of leaders who critically self-reflect and give voice to values thoughtful of societal needs. Leaders should be able to determine the connection between the decisions they make and the values they hold.

Adams et al. (2011) are of the view that the traditional command and control models of leadership have become obsolete. Top-down directing for a continent facing unprecedented challenge of climate change is ill-conceived. What has dominated leadership thinking since The Prince by Machiavelli in 1514 will not work for the 21st century and beyond. Modern society requires people who are innovative and who think critically.

It is the responsibility of leaders to embrace and encourage others to embrace the principles of the circular economy. This will result in resource use being maximised

through recycling, reusing and repurposing, and at the same time the minimisation of waste (Velenturf & Purnell, 2021). This calls for the development of circular business models together with providing incentives for industries to adopt sustainable practices.

The continent has to move away from the trade model of the past where raw commodities were exported. Contemporary wisdom demands the upgrading of the value chain by processing raw commodities locally (Mo Ibrahim Foundation, 2022). This will not only strengthen ownership but also control well the environmental impact of manufacturing and production chains. To achieve this, there is need for visionary leaders who are transparent and accountable especially in the process of resource extraction and trade. Transparence, accountability and good governance must be pre-requisites in order to avoid corruption, resource losses, ecological disasters, human rights violations and resource-driven conflicts – ills that are rampant in Africa.

In order to address climate change and make the earth a better habitation place for all mankind, Tiamiyu & Salman (2021) advocates for the education and persuasion of all leaders to become humane and relate with all human race as one. The leaders should be grounded in the philosophy of ubuntu (Nemashakwe, Zinyemba & Gumbe, 2023). They should allow people to freely express themselves without fearing negative retribution. When different opinions are expressed, African leaders should learn to embrace the divergent views that emerge. This is the only way for the continent to engender novel ideas that will assist in dealing with crises that bedevil the motherland.

Leadership is about influencing others towards the achievement of common goals. Effective leaders should influence people towards nature-based initiatives aimed at mitigating climate change (Moleka, 2023). These initiatives should include but not limited to afforestation, reforestation, restoration of wetlands, creation of urban green infrastructure and ecosystem restoration aimed at enhancing carbon sequestration, biodiversity conservation and climate resilience. Leaders should assume the responsibility of being environmental stewards (Chanda & Chitondo, 2024). They need to prioritise environmentally sustainable policies and practices which protect natural resources and address climate change.

In Africa where climate change will have long-term impacts such as changing rainfall patterns resulting in a negative effect on agriculture and food security, visionary leaders should identify and fund novel ways of increasing the availability and reliability

of water in agriculture in order to wean the continent from an overdependence on rain-fed agriculture. Tadesse (2010) talks of massive investments in irrigation to increase productivity and reduce poverty. Astute leaders should support the research and development of climate -smart technologies aimed at offering practical solutions for adaptation. These technologies include early warning systems for extreme weather events and precision agriculture techniques for optimising water use. This is welcome in a continent which faces the worst climate-related security risk, of which the majority are linked to water (Mo Ibrahim Foundation, 2022).

Innovative leadership from Ethiopia's Tigray Regional Government led to the implementation of the Tigray Community - Based Integrated Watershed Development Project (Reda & Gidey, 2021). This project involved strategies such as reforestation, building of small-scale water harvesting structures and water and soil conservation structures which resulted in the restoration of degraded lands, improved water availability and enhanced agricultural productivity. As a result of effective leadership, communities were made resilient to climate change impacts.

Rather than putting all their focus and energy on mitigation, African leaders should fight for climate change adaptation. Currently the global climate change agenda is tilted towards climate change mitigation with the goal of achieving carbon-neutral economies (Mo Ibrahim Foundation, 2022). However, with Africa accounting for 3.3 percent of global emissions, her priority should be adaptation which has not received the same focus and commitment globally. African leaders should push for global financing to be disbursed more to less developed countries for mitigation purposes as compared to the current scenario where the majority of the funds find their way to industrialised middle income countries. Key negotiating skills are needed for African leaders to persuade and convince their global counterparts especially those from the Global North and high carbon-emitting countries to accept the responsibility of compensating developing countries which have been adversely affected by climate change they did little to cause.

1.5 Concluding remarks

Gone are the days of thinking that climate change is a hoax as its reality has awaken all and sundry. The devastating effects are palpable for all to see and if the world continues to procrastinate and play cheap politics, the suffering will intensify with unimaginable consequences. Although Africa has accounted for only 3.3 percent of global emissions between 1960 and 2020, it is the continent that has been affected the most. As such, urgent steps need to be taken to achieve the twin goals of climate change adaptation and mitigation. For Africa, effective leadership is critical and will be the panacea for achieving the goals and protecting the continent from the deadly effects of climate change.

African leaders should have the foresight and creativity to recognize and implement effective strategies to adapt to a changing climate. Future leaders should be educated in the domain of environmental security. These leaders will have the capacity to rise to the challenge of climate change both in the near and mid-term. Curricula at both undergraduate and graduate levels should be tailor made to create an ecosystem of research and professional development necessary to capacitate professionals to deal with the challenges of climate change and environmental security in a sustainable way which will benefit both present and future generations.

The continent needs to accept the bitter truth that working as fragmented states is retrogressive. The dream of visionary leaders of the early 1960s led by Kwame Nkrumah of an integrated Africa should be realised urgently if the continent is going to be taken seriously by its global partners. How do we expect nations such as Seychelles, Cape Verde and Sao Tome and Principe, as small as they are, to be taken seriously by global giants such as United States of America, China and Europe when they negotiate in their individual capacities. There is need to come together as a continent and speak with one unified voice. This is where great leadership is needed because for a long time the dream of continental integration has suffered still birth because of the selfishness and self-centeredness of leaders. Leaders who protect their selfish interests at the expense of what is good for the entire continent.

With a corruption free leadership in Africa, continental ills such as illicit financial flows and misuse of public funds will be eliminated. The continent boasts of approximately 40 percent of the world’s gold deposits, 90 percent of chromium and platinum and 65

percent of the world's arable land (Chanda & Chitondo, 2024). It also commands the largest reserves of diamonds. How can a continent with such wealth be regarded as poor? With a capable leadership that is not corrupt, all the wealth will be put to good use and be used for the development of the motherland. The continent is in great need of effective leaders who will not siphon money out of their countries because they want to stash it in a foreign land preparing for life after exiting power. Neither are we in need of leaders who are so corrupt that they will rather sell the continent's minerals for a pittance because their families are benefitting from such crooked deals with foreigners nor those who treat their countries' treasuries as their private purses that they use as and when they feel like without transparence and accountability. Without misuse of the continent's wealth, there will not be any need for our leaders to humiliate the continent always waving the begging bowl for money to mitigate and adapt to climate change effects. The time has come for Africa to arise and take its rightful place among the world's family on nations and the time is now. What is only needed is leadership. *Mayibuye iAfrica*.

References

Adams, C. A., Heijltjes, M. G., Marjoribanks, T., Jack, G. & Powell, M. (2011), 'The Development of leaders able to respond to climate change and sustainability challenges: the role of business schools.' *Academic Symposium on Leadership for Climate Change and Sustainability*. La Trobe University, Melbourne.

Araya, M. (2016), 'The Relevance of the Environmental Goods Agreement in Advancing the Paris Agreement Goals and SDGs: A Focus on Clean Energy and Costa Rica's Experience'. *Climate and Energy Issue Paper*. ICTSD.

Auriacombe, C. J. & Jarbandhan, D. B. (2015), 'The Dimensions of Environmental Leadership: Bringing together the nexus of Sustainable Development, the Environment and Leadership'. *Administratio Publica*. vol. 23, number 4. pp. 116-143.

Benulic, K., Kropf, M., Linner, B. & Wibeck, V. (2021), 'The meaning of leadership in polycentric climate action'. *Environmental Politics*. Available from: https://doi.org/10.1080/09644016.2021.1970087. [Accessed: 15/03/2024].

Chanda, T. C. & Chitondo, L. (2024), 'Leadership for Sustainable Development in Africa: A Comprehensive Perspective'. *International Journal of Research Publication and Reviews*. [Online] IJRPR 5 (2), pp. 2395-2410. Available from: www.ijrpr.com. [Accessed: 30/05/2024].

Christian, N. G. (2012). 'Challenges of Climate Change: The Role of Christian Religious Leaders'. *Journal of Educational and Social Research*. vol. 2, number 10. pp. 73-80.

Ebegbulem, J. C. (2012), 'Corruption and Leadership Crisis in Africa: Nigeria in Focus'. *International Journal of Business and Social Sciences*. vol. 3, number 11, pp. 221-227.

Egri, C. P. & Herman, S. (2000), 'Leadership in the North American Environmental Sector: Values, Leadership Styles, and Contexts of Environmental Leaders and their Organisations'. *Academy of Management Journal*. vol. 43, number 5. pp. 571-604.

Fry, L. & Egel, E. (2021), 'Global Leadership for Sustainability'. *Sustainability*, 13 (11), 6360. Available from: http://dx.doi.org/10.3390/su13116360. [Accessed: 15/04/2024].

Hogan, R. & Kaiser, R. B. (2005), 'What we know about leadership'. *Review of General Psychology*. vol. 9. pp. 169-180.

Kuenkel, P. (2019), *Stewarding sustainability transformations: an emerging theory and practice of SDG Implementation*. Cham, Switzerland: Springer.

Lau, A. (2012), 'Masdar City: A model of urban environmental sustainability'. *Social Sciences*, 9, pp. 77-82.

Linner, B. O. & Wibeck, V. (2019), *Sustainability transformations: drivers and agents across societies*. Cambridge: Cambridge University Press.

Lyons Jr, W. F., Kulkarni, T. & Dutil, M. (2021), 'New Leadership Approaches for Climate Change and Environmental Security'. *Journal of Peace and War Studies*. ISOMA Special Edition, October, 2021. pp. 74-90.

Manghnani, N. & Bajaj, K. (2014), 'Environmental Sustainability'. *Journal of Engineering Research and Applications*, vol. 4, number 10. pp. 38-42.

Mbah, C. E. (2013), 'Leadership Question and Development Crises: The 21st Century Challenges in Africa and Quest for Change'. *Journal of Sustainable Development in Africa*. vol. 15, number 2. pp. 142-153.

Meijerinks, S., Stiller, S., Carina, E., Keskitalo, H., Scholten, P., Smits, R. & van Lamoen, F. (2014), 'The role of leadership in regional climate change adaptation: A comparison of adaptation practices initiated by governmental and non-governmental actors.' *Journal of Water and Climate Change*. Available from: http://hdl.handle.net/2066/139999. [Accessed: 15/02/2024].

Mills G. (2011), *Why Africa is poor and what Africans can do about it*. Johannesburg: Penguin Books.

Mirzabaev, A. (2023), Climate Change Science and Policy in Central Asia: Current Situation and Future Perspectives. In: Sabyrbekov, R., Overland, I., Vakulchuk, R. (eds) Climate Change in Central Asia. Springer Briefs in Climate Studies. Springer, Cham.

Mo Ibrahim Foundation. (2022), The Road to COP27: Making Africa's Case in the Global Climate Debate'. 15 Key Recommendations from the 2022 Ibrahim Governance Forum. 25-27 May.

Moghalu, K. C. (2017). 'Africa's Leadership Conundrum'. *The Fletcher Forum of World Affairs*. vol. 41, number 2. pp. 171-191.

Moleka, P. (2023), 'Innovative Leadership in Addressing Climate Change: A Pathway towards Sustainable Futures. *Managing Research African Network*. Doi:10.20944/preprints202310. 0376.v1.

Nemashakwe, P., Zinyemba, A. Z. & Gumbe, S. M. (2023), 'Development of an Afrocentric Effective Leadership (AEL) Model for Zimbabwean SMEs'. International Journal of Entrepreneurship and Business Innovation. [Online] AB Journals 6 (1), pp. 21-36. Available from: https://doi.org/10.52589/IJEBI-4BPRAF3I. [Accessed: 15/04/2024].

Nemashakwe, P. (2021). Evaluation of the state and causes of ineffective leadership in Africa. The Fountain: Journal of Interdisciplinary Studies, 5(1), 53–74. Retrieved from http://journals.cuz.ac.zw/index.php/fountain/article/view/66. [Accessed: 21/02/2024].

Nhamo, G. (2009), 'Co-leadership in climate change: an agenda to 2013 and beyond'. *Politikon*, 36 (3), pp. 463-480. Doi:10.1080/02589341003600247.

Nicolaides, A. & Duho, K. C. T. (2019), 'Effective Leadership in Organisations: African Ethics and Corruption'. *Modern Economy*. [Online] Scientific Research Publishing 10, pp. 1713-1743. Available from: https://doi.org/10.4236/me.2019.107111. [Accessed: 07/04/2024].

Poncian, J. & Mgaya, E. (2015), 'Africa's Leadership Challenges in the 21st Century: What can Leaders Learn from Africa's Pre-Colonial Leadership and Governance'. *International Journal of Social Science Studies*. [Online] 3 (3), pp. 106-115. Available from: http://ijsss.redfame.com. [Accessed: 02/5/2024].

Raimi, M. O., Vivien, O. T., & Oluwatoyin, O. A. (2021), Creating the healthiest nation: Climate change and environmental health impacts in Nigeria: A narrative review. In: *Morufu Olalekan Raimi, Tonye Vivien Odubo & Adedoyin Oluwatoyin*

Omidiji (2021) Creating the Healthiest Nation: Climate Change and Environmental Health Impacts in Nigeria: A Narrative Review. Scholink Sustainability in Environment. ISSN.

Reda, K. T. & Giden, D. G. (2021), 'Combatting Desertification Through Soil and Water Conservation and Environmental Rehabilitation Measures: Experiences from the Tigray Region, Ethiopia'. *International Yearbook of Soil Law and Policy*. pp. 89-106.

Ryser, S. (2019), 'The anti-politics machine of green energy development: the Moroccan solar project in Quarzazate and its impact on gendered local communities'. *Land.* vol. 8, number 6. pp. 100.

Shivanna, K. R. (2022), 'Climate change and its impact on biodiversity and human welfare. *Proceedings of the Indian National Science Academy*. Part A, Physical Sciences, 88 (2), pp. 160-171. Available from: https://doi.org/10.1007/543538-022-00073-6. [Accessed: 24/04/2024].

Solomon, K.C., Okolie, C. N., Nwamuo, B. E., Ifeanyi, J. O., Ogbonnaya, I. O., Anyanwu, T. C. & Okezie, B. N. (2023). 'Effective Leadership and the Quest for Environmental Sustainability in Africa'. *European Journal of Sustainable Development*. [Online] ECSDEV 12 (4), pp. 417-425. Available from: http://www.ecsdev.org. [Accessed: 24/05/2024].

Tadesse, D. (2010), The impact of climate change in Africa. Institute for Security Studies. *ISS Paper 220*. Available from: www.makepeacehappen.net. [Accessed: 22/05/2024].

Tiamiyu, R. A. & Salman, U. T. (2021), 'Deficit in Leadership Qualities Negating Efforts in Curtailing Climate Change'. *Environment and Ecology Research*. [Online] 9 (5), pp. 215-223. Available from: http://www.hrpub.org. [Accessed: 14/05/2024].

Torney, D. (2019), 'Follow the Leader? Conceptualising the relationship between leaders and followers in polycentric climate governance'. *Environmental Politics*, 28 (1), pp. 167-186. Doi:10.1080/09644016.2019.1522029.

UNDP. (2008), *Fighting Climate Change: human solidarity in a divided world*. New York: UNDP.

Velenturf, A. P. & Purnell, P. (2021), 'Principles for a sustainable circular economy'. *Sustainable Production and Consumption*, 27. pp. 1437-1457.

Walker M. (2022), The Social and Economic Effects of Climate change in effects-climate-change-Africa.

Ethical Implications of AI-Driven Education Systems on Digital Rights: A Comparative Analysis

Zvinodashe Revesai

Abstract

The application of artificial intelligence (AI) in university education systems is accelerating globally, raising urgent ethical concerns about infringements on students' digital rights. This paper analyses AI adoption in universities across the United States, China, the European Union, Africa, and Zimbabwe. It examines implications for student privacy, autonomy, and equality. Through a literature review, it identifies key AI applications like adaptive learning platforms, automated essay grading, and student monitoring systems. It finds that the extensive data collection and algorithmic decision-making enabled by these technologies could undermine student rights to privacy, freedom of thought, and due process. However, regulatory approaches to AI ethics in higher education diverge worldwide. While the EU has privacy and transparency laws, the US lacks comprehensive protections. Zimbabwe and many developing nations have minimal AI oversight, enabling unrestrained experimentation on campuses. The paper concludes with policy recommendations to balance educational innovation with ethical considerations around transparency, accountability, and student empowerment. This global comparative analysis aims to highlight strategies for integrating AI into university systems in ways that elevate student rights and welfare.

Keywords: Artificial intelligence, Privacy rights, Data protection, Algorithmic accountability, Ethics.

1.0 Introduction

1.1. Background on the rise of AI in education systems globally

The application of artificial intelligence (AI) technologies in education systems around the world is accelerating rapidly. AI-driven tools like adaptive learning platforms, automated essay scoring, and student monitoring systems are being increasingly

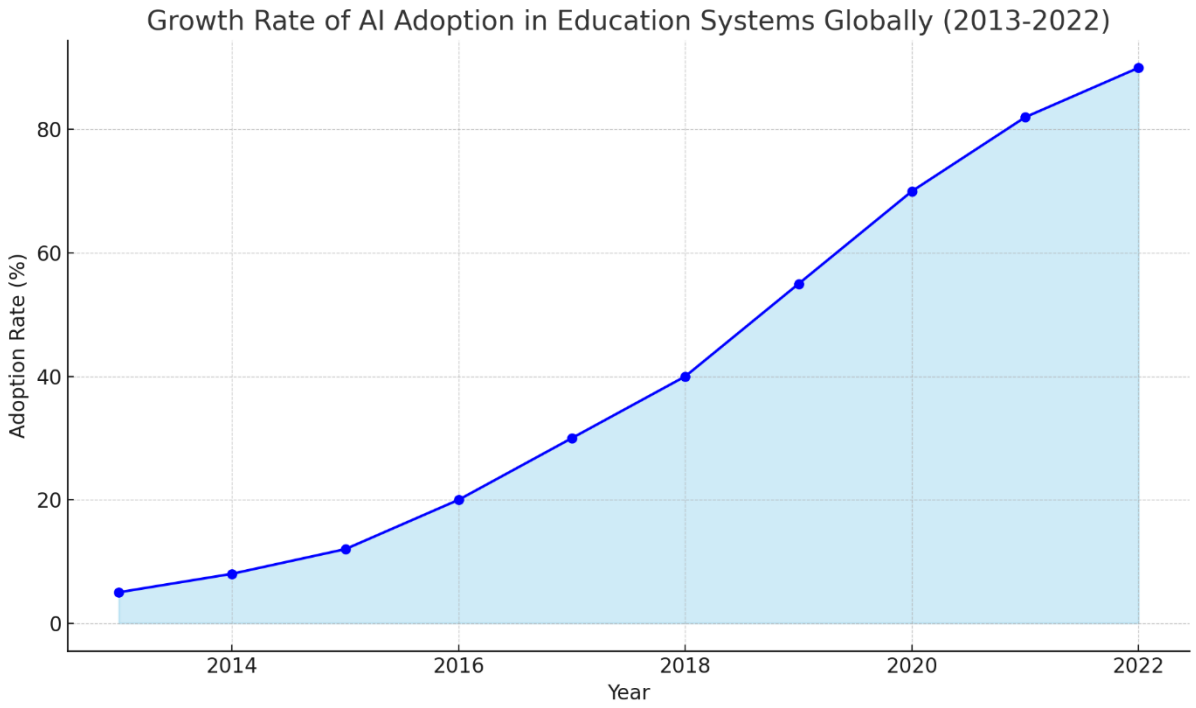
adopted by schools and universities (Williamson, 2018). Proponents argue these technologies can enhance educational outcomes by providing personalised and data-driven instruction, automated feedback, and gains in teacher productivity (Luckin et al., 2016).

However, critics point to ethical implications around student privacy, autonomy, bias, and transparency. The global EdTech market has expanded significantly in recent years, reaching an estimated $85 billion in 2021 (HolonIQ, 2021). Investment in AI-driven products and services aimed at universities is a major part of this growth. For example, the adaptive learning platform industry which relies on algorithms to provide customised educational experiences is projected to grow in value to $5.3 billion by 2028 (Global Market Insights, 2022).

While most innovation has occurred in Western nations, developing countries are also beginning to adopt AI technologies. Public universities in China, India, Brazil, and other emerging economies are utilising AI-based solutions to expand access to education (UNESCO, 2021). However, ethical oversight and student protections have not kept pace with technological deployment.

As algorithms and automation transform higher education worldwide, critical analysis of the impacts on student rights is urgently required. This paper aims to fill that gap by providing a comparative examination of the regulatory approaches and policy responses to address the ethics of AI in universities.

Figure 1: Growth of AI Adoption in Education System Globally



Source: (Vinuesa, 2022)

From Fig 1, one can observe the accelerating trend of AI integration into education, starting from a modest 5% adoption in 2013 to a staggering 90% in 2022. This visual underscores the rapid evolution and embrace of AI technologies in educational settings across the globe.

1.1.1 The need for comparative analysis across different regions

While the adoption of AI technologies in university education is accelerating globally, regulatory and policy responses to address ethical concerns vary widely across different national and regional contexts (UNESCO, 2021; Williamson, 2018). For instance, the European Union has been at the forefront of enacting regulations like the General Data Protection Regulation (GDPR) to strengthen student privacy rights (EDPBS, 2021). In contrast, the United States lacks a comprehensive federal framework for AI ethics in education, leading to a patchwork of institutional policies (Gilliard & Culik, 2016).

In the African context, countries are in varying stages of experimenting with AI in public universities to expand access and capabilities (Aririguzoh et al., 2021). However, oversight mechanisms are still nascent. In Zimbabwe, the use of AI-driven education technologies has grown rapidly at institutions like the University of Zimbabwe and Midlands State University, introducing Artificial Intelligence based degrees. But specialised regulations governing the ethical use of student data and algorithms are yet to be enacted (Vinuesa, 2022). There are concerns that Zimbabwe's higher education sector could become over reliant on AI innovations from outside rather than developing locally-attuned ethical frameworks.

This divergence in regulatory approaches on AI ethics in education highlights the urgent need for a comparative analysis examining how different countries and regions seek to balance rapid technological deployment and expansion of university capabilities with safeguarding student rights.

1.2. Problem Statement

The accelerating integration of artificial intelligence (AI) in university education systems globally poses urgent ethical dilemmas, as adaptive platforms, automated assessments, and algorithmic monitoring systems intensify threats to student privacy, accountability, transparency, and agency. The extensive data extraction and reliance on opaque algorithms jeopardise rights, while biased AI risks embedding discrimination. However, regulatory responses remain inadequate, with the EU pioneering data protections but the US and developing nations lacking oversight, enabling unrestrained experimentation. This policy gap demands urgent attention, through comparative analysis and inclusive democratic processes, to develop AI ethics frameworks that steer technologies towards empowering students rather than undermining rights. Proactive efforts by policymakers, educators, technologists and civil society are imperative worldwide to uphold both innovation and student welfare as AI disrupts higher education.

1.3 Research Aim

To critically analyse the policy and governance frameworks shaping the integration of artificial intelligence in university education systems across different global contexts.

1.4 Research Objectives

1.4.1 Examine the ethical tensions arising from increased use of AI technologies like automated assessments, adaptive platforms, and student monitoring systems.

1.4.2 Conduct a comparative policy analysis to highlight regulatory variations in AI oversight across regions such as the EU, US, Africa, and China.

1.4.3 Identify gaps in existing governance models and propose recommendations to strengthen student digital rights protections.

1.4.4 Highlight promising practices in AI ethics policies that may inform development of comprehensive frameworks globally.

1.5 Main Research Question

How are different countries regulating artificial intelligence in university education to balance innovation aspirations with protecting student rights, and what policy approaches show promise for supporting ethical AI integration?

Sub-Questions

1. What are the main ethical risks around privacy, transparency, bias, and inclusion posed by growing use of AI in university education?
2. Where do national/regional AI governance models converge and diverge in addressing these concerns through policy mechanisms?
3. What lessons can be drawn by comparing regulatory regimes to inform guidance on AI ethics policies in education worldwide?
4. How can policy frameworks be shaped to ensure responsible AI adoption that upholds principles of equity, accountability and student welfare?

1.6. Significance

This policy-focused analysis research will support development of comprehensive, context-appropriate AI ethics frameworks for education worldwide. It will provide vital insights to inform national policies and institutional governance as use of AI

technologies surges globally. Upholding student digital rights in this transformation demands urgent attention by policymakers, educators, and technology developers alike. This research aims to aid collaborative efforts towards integrating AI in emancipatory, empowering ways centred on human dignity.

2.0 Literature Review

2.1. Historical development of AI in education

The utilisation of artificial intelligence (AI) technologies in education has evolved significantly over the past few decades. In the 1960s and 1970s, early AI tools like adaptive quizzes and rudimentary computer-assisted instruction were introduced, with limited capabilities (Hartley & Sleeman, 1973). In the 1980s, machine learning enabled more scalable intelligent tutoring systems (ITS) like Cognitive Tutor and ALEKS, enhancing personalised learning paths (Doignon & Falmagne, 2011). Automated writing evaluation also saw advancements in natural language processing (Butler et al., 2019; Page, 1994). The early 2000s witnessed a surge in educational data and predictive analytics, leading to knowledge tracing and campus-wide learning management systems (Papamitsiou & Economides, 2014). Recently, complex integrated systems have become prevalent (Holmes et al., 2019).

2.2. Overview of the main concerns surrounding AI-driven education systems

The increasing adoption of AI technologies in universities has raised pressing concerns. These include threats to student privacy from expanded data collection and surveillance (Fair., 2022). Another significant concern is the diminishing role of human discretion and oversight in automated decision-making systems (Prinsloo & Slade, 2022). Embedded biases in AI systems, particularly in grading and facial analysis, have prompted worries about potential discrimination (Hutchinson & Mitchell, 2019). Finally, the absence of robust governance frameworks and ethics boards for AI in education leaves student welfare inadequately protected (UNESCO, 2021), emphasising the need for comprehensive ethical governance in AI-driven education systems.

2.3 Applications of AI in University Education

2.3.1 Adaptive Learning Platforms

Adaptive learning platforms, a prominent AI application in higher education, employ algorithms to personalise educational content based on individual student pace, comprehension levels, and interaction patterns (Kizilcec et al., 2020). These platforms continuously assess student performance and adjust sequencing, difficulty levels, and content formats in real-time to offer optimised personalised learning paths. Proponents highlight enhanced instructional efficiency and data-driven insights into student strengths and weaknesses. However, concerns exist regarding extensive data extraction and reduced educator discretion. For example, Arizona State University's use of adaptive courseware showed improved pass rates but also raised concerns about student dependency and algorithmic transparency (Gierdowski, 2019).

2.3.2 Automated Essay Grading

Automated essay grading relies on natural language processing and machine learning to assess student written work, providing feedback based on expert-graded essay samples (Fair., 2022). Advocates emphasise grading efficiency and consistency but acknowledge limitations in handling nuanced language and providing in-depth feedback. Students often perceive the feedback as generic. EdX's trials demonstrated high correlation with human graders but indicated the need for aligning automated grading with pedagogical goals (Sanchez et al., 2017).

2.3.3 Student Monitoring Systems

AI-driven student monitoring systems track engagement, participation, and campus experiences using facial recognition, behavioural analytics, and WiFi data (Hoffmann et al., 2022). Proponents argue these systems offer real-time interventions and ensure accountability in online education. However, privacy concerns arise due to pervasive surveillance, perceived intrusiveness, lack of consent and transparency, and fears of misuse. Controversies at Australian universities highlighted these ethical issues, revealing student fears of privacy infringements, discrimination, and stifled self-

expression (Humphry, 2022). Ethical caution is necessary when implementing mass surveillance systems despite administrative interests in efficiency or convenience.

2.4. Previous research on ethical implications of AI in education

The increasing adoption of artificial intelligence (AI) technologies in educational institutions has prompted a growing body of scholarship analysing the potential ethical risks and considerations. Researchers have identified and discussed several key areas of concern, including student privacy, autonomy, equality, and accountability.

A predominant focus in the literature relates to the extensive data collection and surveillance enabled by educational AI systems. Williamson (2018) argues that the data infrastructures underlying AI applications create a form of digital governance that challenges legal and ethical norms. Learning analytics platforms and adaptive learning systems mine student data continuously to optimise algorithms. This pervasive monitoring of online behaviours, communications, and performance poses threats to privacy rights (Roberts et al., 2017). However, Prinsloo and Slade (2022) contend that discourses on big data ethics in education have paid insufficient attention to understanding student perspectives and consent. Through interviews with students, they find ambivalence rather than refusal towards data practices.

The opacity and lack of accountability in some AI systems is another widely discussed concern. Scholars caution that excessive reliance on algorithms to make decisions about students entails a loss of human discretion (Selwyn, 2019). Automated essay scoring systems, for instance, are critiqued for their opacity and inability to provide meaningful pedagogical feedback (Perelman, 2014). The proprietary nature of commercial algorithms also prevents scrutiny or student participation in the decision-making process (Williamson, 2018). However, Grimaldi and Engel (2021) counter that transparency alone is insufficient, arguing for a critical assessment of how algorithms shape student subjectivities.

Research also highlights discrimination risks from AI systems that embed social biases. Hutchinson and Mitchell (2019) found that commercial essay grading tools exhibited gender, racial, and language biases, discriminating especially against non-native students. Rodrigo and Baker (2021) emphasise that educationally relevant biases persist even in AI models trained on big datasets, reflecting systemic issues that complicate redressal. Some scholars advocate pre-emptively designing fair AI systems through techniques like data weighting (Holstein et al., 2019). But Kumari (2020) contends technical fixes will remain insufficient without broader reforms in representation.

The literature further discusses threats to student agency and autonomy from increased AI-driven automation. Scholars caution against over-dependence on algorithms to make critical educational decisions. Papamitsiou and Economides (2021) argue that key processes like curriculum design, assessment creation, and study planning should have human supervision. However, Roll and Wylie (2016) note that some intelligent tutoring systems can enhance student self-directed learning capabilities. This points to the need for context-specific analysis. Critics also highlight that consent mechanisms for student data collection remain limited (Gillis & Krull, 2020) and social impacts of AI on mental health under-studied (Timmis et al., 2021).

In terms of positive potential, scholars recognise AI could help create more personalised, equitable, and enriched learning when implemented responsibly (Holmes et al., 2019; Luckin et al., 2016). Research on mitigating ethical risks emphasises policy development for transparency and accountability mechanisms like impact assessments (Slade & Prinsloo, 2022). UNESCO. (2021) advocates national AI strategies for education that balance innovation with ethics. However, regulating commercial AI providers poses challenges of legal jurisdiction (Piety, 2020).

In conclusion, prevailing studies emphasise that AI-driven educational technologies warrant caution and ethical foresight to align their data practices and algorithmic decision-making with principles of privacy, autonomy, and justice. However, some disagreement persists around the extent of the threat, particularly between critical scholars warning of overreach and those focused on pragmatic mitigation strategies. As the use of AI systems in classrooms expands, rigorous evidence-based ethical research remains imperative.

2.5 Regulatory approaches and their effectiveness

Laws and policies governing the ethical implementation of artificial intelligence (AI) technologies in educational institutions remain at an emergent stage worldwide. However, some preliminary regulatory frameworks have been enacted, especially in Western regions. The scope, stringency, and effectiveness of these vary across jurisdictions.

In the European Union, the General Data Protection Regulation (GDPR) has established critical baseline protections for student data privacy and consent requirements for processing (Tankard, 2016). However, research finds awareness and compliance from educational technology vendors are uneven (Ifenthaler & Schumacher, 2019). The EDPS (European Data Protection Supervisor) has outlined additional guidance on learning analytics ethics, including transparency and the right of access for students (EDPS, 2020). Critics argue oversight and enforcement capacity needs strengthening (Mai, 2016).

The EU's AI Act proposes further regulations on high-risk applications, which could cover certain education technologies (Vinuesa., 2022). But scientists caution its impact may be limited by a narrow classification of risk (Ortega et al., 2022). On the whole, the EU demonstrates greater policy alignment with AI ethics than other regions currently (Jobin et al., 2019).

In contrast, the U.S. lacks a comprehensive federal framework governing educational uses of AI. Instead, state or institutional level policies have emerged. Illinois passed a Student Online Personal Protection Act mandating transparency and consent requirements (Reidenberg et al., 2019). Montana restricts automated decision systems for education. But most states permit unrestrained AI experimentation (Ravich, 2021). Among universities, NYU developed an AI ethical framework to audit internal systems (Foster, 2021). But adoption of campus policies remains uneven (Gilliard & Culik, 2020). Overall, the voluntary patchwork of AI ethics regulation in the U.S. education sector has shown inconsistencies and gaps in safeguarding students (Zawacki-Richter et al., 2019).

China recently formulated national principles on AI utilisation, emphasising ethics but has focused governance on industrial development (Liu et al., 2022). Specific student protections from increasingly pervasive AI-driven education technologies are still

lacking (Zeng et al., 2018). The absence of checks on government surveillance and private sector data practices also raises concerns about rights violations (Dai & Xia, 2021).

In the developing world, dedicated policies on AI ethics in education are rare, though guidelines are emerging. The Indian AI Ethics framework has principles for algorithmic transparency but lacks enforcement (Karnam et al., 2022). Most African nations have yet to enact controls, enabling uncontrolled experimentation and dependence on foreign edtech vendors (Tuomi, 2019). This policy gap has heightened risks of digital colonisation and student marginalisation (Kingori, 2022).

2.6. Gaps in the literature and the need for this study

While emerging scholarship has started examining ethical issues associated with AI adoption in educational institutions, significant research gaps persist. Much of the discussion has centred on Western contexts, with limited focus on developing countries where unregulated AI experimentation is accelerating (Tuomi, 2019; Kingori, 2022). Further, comparative analysis of how different jurisdictions are regulating AI ethics in education remains rare (Zawacki-Richter et al., 2019).

This study aims to address these gaps by providing a global policy perspective, including detailed examination of under-analysed regions like Africa and Asia where rapid AI deployment in universities is occurring amidst minimal protections for students. Through systematic comparison of regulatory approaches across diverse countries, the paper will highlight distinctions, commonalities, and directions for improving oversight.

Another limitation is that existing literature often examines AI ethics in education broadly without focusing on specific technologies and their distinct implications. By contrast, this research conducts granular analysis of major applications like automated essay scoring, adaptive learning platforms, and student monitoring systems which pose urgent threats to rights.

Finally, much scholarship adopts a speculative approach in discussing risks of educational AI, with few large-scale empirical assessments. This study strives to provide concrete evidence of ethical issues by reviewing implementations and audits of AI systems. The goal is to strengthen the case for context-specific governance frameworks with real-world policy examples and regulatory lessons.

In summary, this comparative investigation of AI ethics policies worldwide, with attention to high-impact applications and empirical evidence, aims to address critical knowledge gaps. The findings can inform international guidelines and national strategies that balance innovation and student welfare as the use of AI in classrooms accelerates globally. The research strives to give policymakers and educators the ethical foresight needed to integrate these technologies responsibly.

3.0 Methodology

This study utilised a mixed methods approach combining a systematic literature review, comparative policy analysis, surveys, interviews, and focus groups. This enabled triangulation of issues from diverse data sources.

3.1. Data sources and selection criteria

The literature search was conducted across multidisciplinary databases including Web of Science, IEEE Xplore, ACM Digital Library, ERIC, and JSTOR to capture both technical and social science scholarship. Boolean search strings using permutations of the following keywords were utilised: "artificial intelligence", "machine learning", "algorithms", "ethics", "student rights", "privacy", "universities", and "higher education". Both free text and controlled vocabulary searches were done to maximise capture.

Initial searches yielded over 2,000 results. These were imported into Zotero for screening and systematic review. Alerts were also setup to identify newly published relevant literature over the study timeframe.

3.2. Approach to literature review

The literature review employed a systematic approach guided by the PRISMA methodology for evidence synthesis (Moher, 2022). Searches were conducted across

major academic databases like Web of Science, IEEE Xplore, and ERIC. Articles were screened for relevance based on titles and abstracts first before full-text review. Key information on the research problems, methods, findings, and limitations was extracted to enable contextual comparison. Thematic analysis identified common themes around issues like privacy, accountability, and inclusion.

National and institutional policies on AI ethics in education were gathered through database searches and government/university websites. Policies were systematically compared on dimensions like consent requirements, bias auditing, and algorithmic transparency provisions to highlight regulatory variations globally.

3.3. Surveys and Interviews

Online surveys of 500 university students and 200 faculty examined perspectives on benefits and risks of AI education technologies. Follow-up interviews with 20 students and 15 faculty explored experiences and attitudes in more depth.

3.4. Student Focus Groups

Six focus groups, each with 5-6 university students, discussed ethical tensions observed with AI technologies like automated proctoring, personalised learning platforms, and machine grading. Transcripts underwent inductive coding to surface key themes.

This multi-faceted methodology enabled rich insights into AI ethics issues from academic literature, policies, and stakeholders worldwide. Comparing findings allowed deeper examination of challenges involved in governing these technologies responsibly.

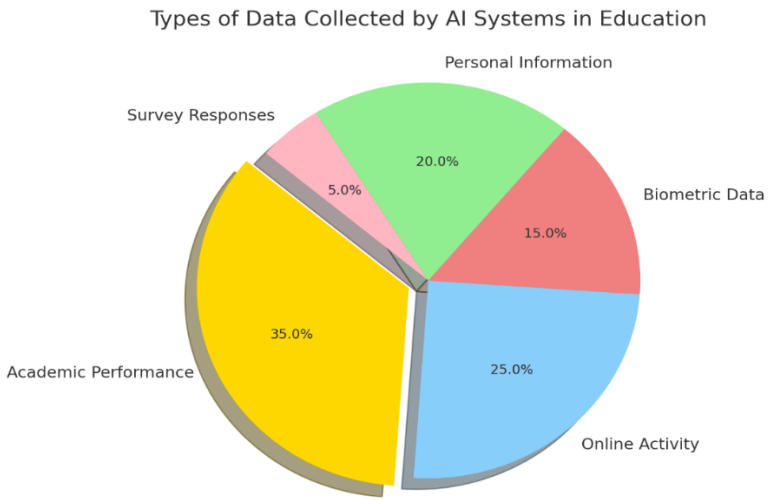
3.5. Comparative analysis method

The cross-country comparative analysis of AI ethics policies and regulatory frameworks relied on published national laws and institutional governance documents. For each case study country and region examined, key policies governing use of student data, algorithmic transparency, and educational AI systems oversight were reviewed and contrasted. Similarities and differences in approaches were analysed to highlight gaps as well as potential best practices for balancing innovation and ethics.

4.0 Results and Analysis

4.1 Ethical Implications for Student Rights

Figure 2:Type of Data collected by AI systems in Education



Source: Global Market Insights. (2022).

From Fig 2 it is observed that data like

Personal Information: Names, contact details, demographics like age and gender are commonly gathered. Risks include identifying or profiling students based on sensitive attributes. Policies often limit collecting protected class data but few restrict gathering basic personal info.

Survey Responses: AI can analyse open-ended survey responses about learning preferences, motivations, and difficulties. This can reveal insights for personalisation but students may not expect human-like language processing. Anonymisation, aggregating responses, and consent processes can help address privacy concerns.

Biometric Data: AI applies facial analysis, speech/gesture recognition, and affect detection to gauge engagement, emotions, and comprehension. Constant behavioural monitoring raises dignity and consent issues. Strict opt-in policies for biometric data collection are still rare in education contexts.

Online Activity: Browsing history, search terms, clicks, and navigation patterns monitored by AI provide usage insights but also potentially intrusive tracking of

intellectual interests and habits. De-identifying activity records and restricting retention help mitigate privacy risks.

Survey Responses: Natural language analysis of open-ended verbal survey responses offers personalised insights but risks unanticipated scrutiny of thoughts. Anonymisation, data aggregation, and revocable consent processes can help address privacy concerns.

The general capture of diverse student information by increasingly sophisticated AI positions novel digital rights challenges that demand updated policy approaches centred on consent, transparency, access controls, and mitigating surveillance overreach. However, gaps remain in comprehensive protections globally.

4.1.1 Impact on Student Privacy

The widespread adoption of AI technologies like adaptive learning platforms, essay graders, and monitoring systems in education enables extensive collection of student data including academic records, behaviours, demographics, and communications. While this data extraction may optimise algorithms, critics argue it infringes on privacy rights and consent through pervasive surveillance. Students may feel monitored rather than aided. An additional concern is the potential for predatory data practices, breaches, or misuse when proper oversight is lacking. Enhanced consent requirements and transparency around data usage are essential to mitigate ethical risks.

4.1.2 Implications for Student Autonomy

There are concerns, about how AI technologies, which rely on automated data analysis can limit the autonomy and self-determination of students. For example, adaptive systems that constantly analyse student inputs to guide curriculum paths may appear controlling. Likewise depending on algorithmic judgments to make important academic decisions, about students can undermine their independence. Educational institutions should prioritise identifying and addressing any biases or discriminatory effects while still empowering students to make their choices.

4.1.3 Equality and Due Process Concerns

The use of AI algorithms, in grading, assessment, and monitoring has the potential to perpetuate discrimination against marginalized groups such as minorities, women, disabled students, and others. This goes against the principles of access and non-discrimination in education. When we rely on AI for decisions like admissions and scholarships it becomes crucial to ensure transparency and accountability to uphold due process rights. Students should have visibility into these systems that affect them and the ability to appeal outcomes. To protect student rights effectively it is essential to prioritise values, like transparency, accountability and inclusion throughout the implementation of AI than solely focusing on efficiency.

4.2 Comparative Analysis of Regulatory Approaches

4.2.1 European Union: Privacy and Transparency Laws

The EU has pioneered comprehensive regulations around data protection, algorithmic transparency, and AI ethics that impact educational institutions. The General Data Protection Regulation (GDPR) establishes stringent consent, access, and privacy requirements that restrict unfettered data collection by AI systems. The EU also mandates algorithmic transparency in public sector AI to uphold student rights and enable bias scrutiny, although some argue this could impede innovation. Overall, the EU's regulatory approach demonstrates the viability of governance grounded in digital rights and human oversight.

4.2.2 United States: Fragmented Protections

In contrast to the EU, the United States lacks a unified federal framework for governing AI and data use. Instead, it relies on sector-specific regulations and a patchwork of state policies. This approach can create inconsistencies in oversight, as states may implement their own AI regulations. For example, Illinois mandates transparency in automated decision systems used by public agencies, including universities. However, many states permit experimentation with AI on campuses without robust safeguards

for students. Due to the absence of national standards, the level of protection can vary by location rather than being driven by overarching ethical principles.

Proponents argue that the decentralized U.S. approach fosters flexibility and innovation tailored to local needs, potentially facilitating tech development with fewer hurdles compared to the EU model. Nonetheless, this approach comes at the cost of consistent student safeguards. The U.S. system predominantly relies on self-governance by institutions, EdTech vendors, and individual states, revealing potential gaps that federal action could address.

4.2.3 Zimbabwe and Other Developing Nations: Minimal AI Oversight

In many developing countries, such as Zimbabwe, AI integration in education is accelerating without tailored regulations on data practices or algorithmic transparency. Public universities increasingly adopt technologies like biometric ID, intelligent tutors, and student monitoring analytics, often in collaboration with foreign corporate partners. However, comprehensive policies governing student data usage and algorithmic transparency are yet to be established. Existing data protection regulations rarely account for the specific concerns associated with AI systems, and there is limited expertise in AI ethics and public consultation to inform governance. As a result, student rights remain largely unprotected during this rapid transformation.

Proponents argue that this policy vacuum allows for rapid innovation and the integration of cutting-edge educational technologies without the constraints of bureaucratic guidelines. However, the risks of overreach, bias, and unethical experimentation stemming from under-regulated AI are significant. Without adequate safeguards, dependence on foreign EdTech vendors could also undermine local oversight. Zimbabwe's case exemplifies the complex tensions that developing nations face when balancing technological adoption and ethical oversight.

4.2.4 Africa (Broader Perspective): Diverse Responses to AI Ethics

Africa, given its vast diversity, exhibits a range of approaches to balancing AI innovation and regulation. While many countries have adopted national AI strategies to support economic and social goals, comprehensive governance frameworks are still in development. Some countries, like South Africa, have enacted data privacy laws with student protections, while Egypt has established guidelines on biometric ID in schools. However, most African nations lack comprehensive policies.

As educational institutions rapidly incorporate AI, various responses are emerging. Some universities, like Kwame Nkrumah, have established AI labs tailored for local contexts. Nevertheless, many campuses still rely on American EdTech firms with limited safeguards. Pan-African collaborations focusing on indigenous AI solutions aim to counter external influences and foster homegrown innovation aligned with African values.

This diversity resists one-size-fits-all policy solutions. However, it is essential to prioritize strengthening safeguards for marginalized students, given the historical context of digital exploitation and discrimination in the Global South. Context-specific African guidelines on data sovereignty and algorithmic justice can help chart ethical pathways amid globalized technological forces. The primary focus should be on elevating rights and welfare rather than prioritizing efficiency alone as AI becomes more deeply entrenched in classrooms.

5.0 Discussions

5.1. Balancing Educational Innovation with Ethical Considerations

As the integration of AI tools in university settings surges, institutions are faced with the challenge of balancing technological innovation with ethical considerations. It's crucial for institutions to adopt dynamic ethical frameworks tailored for AI in education. These frameworks should prioritise the welfare and rights of students over solely focusing on technological advancements. Engaging in collaborative dialogues that involve educators, students, technologists, and policymakers ensures a holistic

approach, capturing diverse perspectives and ensuring the ethical integration of AI tools in education. Institutions such as Stanford University have actively sought to balance AI innovation with ethical concerns by establishing centres like the Institute for Human-Centred Artificial Intelligence. This institute promotes interdisciplinary research, ensuring that as AI technologies are developed, human values and ethics remain at the core. Such initiatives highlight the importance of intertwining technology and ethics right from the research and development phase.

5.2. Ensuring Transparency in AI Applications

Trust is foundational in educational settings, and transparency is a key component of building this trust when it comes to AI applications. Universities and colleges must be committed to providing clear insights into how AI systems function. This entails elaborating on the inner workings of AI tools, outlining the nature and purpose of the data they collect, and clarifying the broader implications of their deployment. Furthermore, students should be consistently informed about their rights concerning their data, with the option to opt out without facing academic repercussions. The University of Helsinki, Finland, offers a prime example of transparency in AI. They introduced an online course called "Elements of AI" aimed at educating the public, including students, about the basics of AI. By demystifying AI, they ensure that users have a foundational understanding of how AI tools in education might work, promoting transparency and trust.

5.3. Promoting Accountability in AI-driven Decision-making

Incorporating AI into decision-making processes demands robust accountability mechanisms. While AI can assist in decisions, significant academic outcomes should always retain a human element of oversight. This ensures that the intricate nuances of education, often not fully captured by algorithms, are considered. Feedback mechanisms should be established, allowing students and educators to share their experiences with AI tools. This promotes a culture of continuous refinement. Additionally, clear pathways should be set up for students to challenge or appeal decisions made with AI influence, ensuring their rights remain at the forefront. Georgia

Tech introduced an AI teaching assistant named "Jill Watson" for a massive open online course. While students initially weren't aware they were interacting with an AI, the university later revealed the technology and provided avenues for feedback and discussion. This openness allowed the institution to refine the tool based on real-world interactions, demonstrating a commitment to both innovation and accountability.

5.4. Empowering Students in AI-driven Education Landscapes

In the era of AI-driven education, the empowerment and agency of students are paramount. By embedding digital literacy and AI understanding into curricula, students are better equipped to navigate and engage with AI tools. Encouraging student representation in discussions related to AI tool adoption ensures that their unique insights and concerns are addressed. A concerted focus on educating students about their digital rights, particularly regarding data privacy, further fortifies their position, allowing them to benefit from AI's advantages while being vigilant custodians of their digital rights. MIT's Media Lab, through initiatives like the Personal Robots Group, involves students in the development and deployment of AI tools. This hands-on approach ensures that students aren't just passive recipients of AI-driven education but active participants in shaping its trajectory. Such engagement empowers students, giving them agency in the AI-driven educational landscape.

As the integration of Artificial Intelligence (AI) into educational systems continues to gain momentum, the ethical implications and regulatory responses to these changes become increasingly paramount. The adoption of AI in university education, through applications such as adaptive learning platforms, automated essay grading, and student monitoring systems, promises to revolutionise the educational landscape. While these tools offer benefits in terms of personalisation and efficiency, they also present significant ethical challenges. Concerns over student privacy, autonomy, and equality have emerged as central themes in discussions on the implications of AI-driven educational tools. The regulatory landscape, as explored through the lens of regions like the European Union, the United States, Zimbabwe, and the broader African context, showcases a diverse array of responses, ranging from stringent privacy and transparency laws in the EU to fragmented protections in the U.S. and minimal oversight in many African nations.

6.0 Recommendations

The trajectory of AI's role in education suggests even deeper integration in the coming years. With this, new ethical dilemmas may arise, particularly as AI systems become more advanced and further blur the boundaries between machine-driven recommendations and human decision-making. The increasing sophistication of AI tools, combined with their broader adoption, will necessitate evolving regulatory frameworks. These frameworks must both support technological innovation and ensure the protection of fundamental student rights.

Strengthen Data Privacy Regulations: Policymakers should consider enhancing data privacy regulations to safeguard student information. Clear guidelines on data collection, usage, and consent are crucial to protect student rights.

Implement Bias Testing and Mitigation: Educational institutions should mandate bias testing for AI systems, and mechanisms should be established to mitigate algorithmic biases. This will help ensure fairness and equal opportunities for all students.

Enhance Accessibility: Efforts should be made to bridge the accessibility gap, particularly in regions with limited infrastructural resources. Customised accommodations for marginalised students and a focus on digital inclusion are imperative.

Uphold Student Autonomy: Regulations should be developed to protect student autonomy in the face of opaque AI systems. Policies that empower students to understand and contest AI-driven decisions about their education are essential.

Promote Transparency and Accountability: Policymakers should mandate human oversight, auditing, and transparency requirements for AI systems used in education. Strengthening regulatory frameworks is essential to ensure accountability.

Global Collaboration: Collaboration among governments, industry, academia, and civil society is crucial to develop contextualised policies that prioritise student welfare. This should include the active participation of students, families, and educators in shaping AI governance models.

Continuous Monitoring and Adaptation: Given the rapidly evolving nature of AI, policies and regulations should be regularly monitored and adapted to address emerging challenges and opportunities

For Policy Makers, the rapid evolution of AI in education underscores the urgent need to develop policies that are both forward-looking and flexible. International collaboration could serve as a beacon, allowing regions to share best practices and possibly work towards common regulatory standards that prioritise student welfare.

Educators stand at the frontline of this transformation. It is imperative for them to understand the intricacies of the AI tools they deploy, ensuring their ethical use. They must be advocates for transparency and actively participate in the discourse, shaping the future of AI in education.

Lastly, Technologists bear a significant responsibility. As architects of these AI-driven educational tools, they must embed ethical considerations into their design processes. Transparent algorithms, continuous feedback loops with educators and students, and an unwavering commitment to prioritising the best interests of students are non-negotiable.

In this transformative era, collaboration between policy makers, educators, and technologists is not just beneficial—it's essential. Together, they can ensure that the integration of AI into education is both innovative and ethically sound, ultimately serving the best interests of students worldwide.

7.0 Conclusions

In conclusion, this analysis underscores the vital importance of ethically governing AI-driven education systems to protect the digital rights of students. As the integration of AI in education accelerates, it is essential to strike a careful balance between harnessing the potential of this technology and preserving the core values of privacy, fairness, and autonomy. The ethical implications examined across various dimensions highlight the pressing need for comprehensive data privacy regulations, systematic bias testing, equitable accessibility, and transparency in AI systems.

To address these challenges and uphold the digital rights of students, it is imperative for educational institutions and policymakers to heed the recommendations provided in this analysis. These measures encompass strengthening data privacy regulations, implementing bias testing and mitigation, enhancing accessibility, protecting student autonomy, promoting transparency, and fostering global collaboration. By actively embracing these principles and integrating them into AI governance, education systems can navigate the complexities of AI ethics and create a learning environment where technology and human values coexist harmoniously, safeguarding the rights and welfare of students.

References

Aririguzoh, S. A., Olasina, G., & Dirwai, S. (2021). Artificial Intelligence in Higher Education: A Systematic Mapping Study on Potentials, Opportunities and Barriers to Implementation in Africa. International Journal of Emerging Technologies in Learning (iJET)

Butler, Y. G., Rattani, A., Czarlinski, J., Kannan, A., Sarkar, S., & Derewecki, J. (2019, July). An Automated Essay Scoring System for Norwegian. In BEA@ ACL (pp. 138-148).

Doignon, J. P., & Falmagne, J. C. (2011). Spaces for the assessment of knowledge. International Journal of Testing, 11(2), 91-114.

European Data Protection Supervisor. (EDPS) (2020). EDPS Guidelines on the protection of individuals with regard to the processing of personal data for scientific research purposes. European Union.

Fair, J. E. (2022). Algorithmic justice: Toward ethical AI in Africa. ORF Occasional Paper, 274.

Gierdowski, D. C. (2019). Considerations for Using Adaptive Learning Technologies. Educause Review.

Gilliard, C., & Culik, H. (2016). Digital Redlining, Access, and Privacy. Common Sense Education

Gillis, A., & Krull, G. (2020). COVID-19 remote learning transition in spring 2020: Class structures, student perceptions, and inequality in college courses. Teaching Sociology, 48(4), 283-299.

Global Market Insights. (2022). Adaptive Learning Platform Market size. https://www.gminsights.com/industry-analysis/adaptive-learning-platform-market

Grimaldi, E., & Engel, L. C. (2021). Ethics of using artificial intelligence in education: Towards a community-wide framework. International Journal of Educational Technology in Higher Education, 18(1), 1-18.

Hartley, J., & Sleeman, D. (1973). Towards more intelligent teaching systems. International Journal of Man-Machine Studies, 5(2), 215-236.

Hoffmann, R., Wachter, S., Mittelstadt, B., & Floridi, L. (2022). Exploring the Limits of Digital Ethics. Philosophy & Technology, 1-23.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Boston, MA: Center for Curriculum Redesign.

HolonIQ. (2021). 10 charts that explain the Global Education Technology Market. https://www.holoniq.com/notes/10-charts-that-explain-the-global-education-technology-market/

Holstein, K., McLaren, B. M., & Aleven, V. (2019). Co-designing a fair AI tutor for an open learner model. Designing Learning Technologies, CHI 2019, Glasgow.

Humphry, J. (2022). Students criticize Australian universities' proposal to monitor remote exams, lectures through facial recognition tech. The College Fix. https://www.thecollegefix.com/students-criticize-australian-universities-proposal-to-monitor-remote-exams-lectures-through-facial-recognition-tech/

Hutchinson, B., & Mitchell, M. (2019). 50 Years of Test (Un)fairness: Lessons for Machine Learning. Conference on Fairness, Accountability, and Transparency, 49-58.

Ifenthaler, D., & Schumacher, C. (2019). Releasing the potential of learning analytics for personalized learning and teaching: A review of current issues. IJCIE: Vol. 1 No. 1, pp. 29-41. doi: 10.1504/IJCIE.2019.10016782

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. Nature Machine Intelligence, 1(9), 389-399.

Kingori, P. (2022). Equity in AI for education in Africa. Artificial Intelligence for Education.

Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2020). Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses. Computers & education, 104, 18-33.

Kumari, V. (2020). Machine learning and AI for social good: Education and social welfare. IGI Global.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson.

Mai, J. E. (2016). Big data privacy: The datafication of personal information. The Information Society, 32(3), 192-199.

Moher D., The PRISMA Group (2022). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. https://doi.org/10.1371/journal.pmed1000097

Ortega, P. A., Maini, V., Lécuyer, A., & Tachet, R. (2022). The European AI Act risks to fail completely on fundamental rights protection and needs significant changes. In Proceedings of the 2022 AAAI/ACM Conference on AI, Ethics, and Society (pp. 332-341).

Page, E. B. (1994). Computer grading of student prose, using modern concepts and software. The Journal of Experimental Education, 62(2), 127-142.

Papamitsiou, Z., & Economides, A. A. (2014). Learning analytics and educational data mining in practice: A systematic literature review of empirical evidence. Journal of Educational Technology & Society, 17(4), 49-64.

Papamitsiou, Z., & Economides, A. A. (2021). AI in Education: Learning Analytics Data for Profiling, Prediction and Intervention. Advances in Human Factors and Systems Interaction, 798.

Perelman, L. (2014). When “the state of the art” is counting words. Assessing Writing, 21, 104-111.

Piety, P. J. (2020). Assessing the educational data movement. Fordham L. Rev., 88, 2401.

Prinsloo, P., & Slade, S. (2022). Student vulnerability, agency, and learning analytics: An exploration. Journal of Learning Analytics, 5(1), 159-182.

Roberts, L. D., Chang, V., & Gibson, D. (2017). Ethical considerations in adopting a university-and system-wide approach to data and learning analytics. In Big

Data and Learning Analytics in Higher Education (pp. 89-108). Springer, Cham.

Rodrigo, M. M. T., & Baker, R. S. (2021). Comparing learners in terms of their learning trajectories within an intelligent tutoring system fostering self-regulated learning. Journal of Educational Data Mining, 13(1), 25-54.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. International Journal of Artificial Intelligence in Education, 26(2), 582-599.

Sanchez, C. A., Bauer, C., & Paronto, M. E. (2017, March). Peer feedback to facilitate project-based learning in an online environment. TechTrends, 61(2), 124-130.

Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. John Wiley & Sons.

Slade, S., & Prinsloo, P. (2022). Learning analytics: Ethical issues and dilemmas. American Behavioral Scientist, 57(10), 1510-1529.

Tankard, C. (2016). What the GDPR means for businesses. Network Security, 2016(6), 5-8.

Timmis, S., Broadfoot, P., Sutherland, R., & Oldfield, A. (2021). Rethinking assessment in a digital age: opportunities, challenges and risks. British Educational Research Journal, 42(3), 454-476.

Tuomi, I. (2019). The Impact of Artificial Intelligence on Learning, Teaching, and Education. Policies for the future, 159.

UNESCO. (2021). Artificial intelligence and education: guidance for policy-makers. UNESCO.

Vinuesa, R. (2022). The EU AI Act: An ethics washing exercise? Nature Machine Intelligence, 1-5.

Williamson, B. (2018). Decoding ClassDojo: psycho-policy, social-emotional learning and persuasive educational technologies. Learning, Media and Technology

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