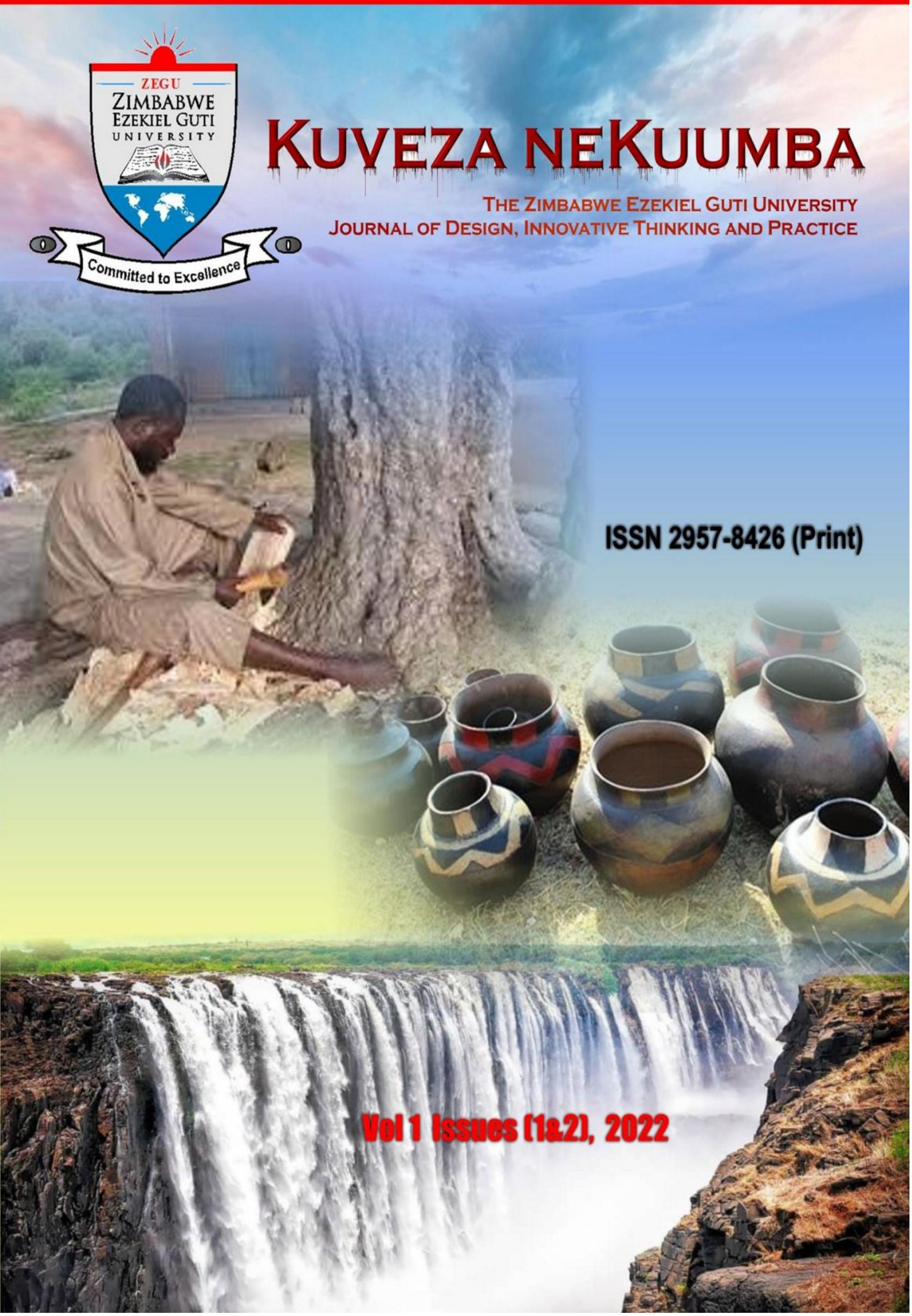

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The *Kuveza neKuumba - Zimbabwe Ezekiel Guti University Journal of Design, Innovative Thinking and Practice* provides a forum for design and innovative solutions to daily challenges in communities.

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The Psychology in Art and Design for Art factual Development in Africa: Reflections on Indigenous Technical Knowledge.

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Abstract

Indigenous African societies' lives revolve around arts and the creation of artefacts. The design of art and artefacts employs abilities defined by the communities as important, according to their belief systems, hence the reference to implicit theories of intelligence. Implicit theories of intelligence were found to be related to indigenous technical knowledge (ITK) that was employed in designing artefacts and arts. These designs and the eventual use of the artefacts and arts have an impact on the development of social norms that shaped the indigenous ways of life. The authors employed a narrative review aimed at finding and summarising existing literature while seeking to identify novel areas of study. The review included papers that informed on architecture and art, tools and implements designs in Africa. Thematic analysis was used to identify recurrent themes that pointed to the existence of implicit theories of intelligence and the creation of social norms through the design and use of art and artefacts. The themes identified included optimal use of strengths and minimisation of weaknesses as a sign of intelligence, design of artefacts for functionality purposes, design as a process of adaption, design as a sign of social status and design as a process to ensure equitable role distribution.

Keywords: theories of intelligence, social intelligence, design, artefacts, sustainable architecture, arts, social norms, taboos, socio-ecological, symbolic.

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INTRODUCTION

Art and artefacts in Africa have been found to have deep meaning to the indigenous communities and how they live, making the two key aspects of indigenous African culture (Tetteh, 2013; Cocodia, 2014). The designs of the tools and equipment created vary according to context (Adewumi and Faida, 2017). Design as a product of culture is, therefore, viewed as both a process and a product of the process, which means it is as dynamic as the cultures that define it. Given the central role that arts and artefacts have in the ways of life of indigenous African communities, understanding how decisions on designs and uses were arrived at, clarifies human behaviour. Through the use of indigenous technical knowledge (ITK), the indigenous people create a sustainable relationship with their ecosystems. ITK refers to a community's culture-specific accumulation of knowledge and development of practices that are derived from their experiences with problems and situations across various aspects of their lives (Sow and Ranjan, 2021).

ITK is linked to implicit theories of intelligence as defined in the field of psychology. Maurial (1999) suggested a cognitive aspect in forming ITK, since the technical knowledge arose from continuous interaction with the environment (Blose, 2019). Shava *et al*. (2010) incorporated aspects of the context, community culture, language and practices, among other things. These cognitive and contextual aspects are key in defining theories of implicit intelligence where abilities are viewed as important if they help the community adapt to the environment, bringing in social responsibility and social intelligence that is defined according to a people's culture (Mpofu *et al*., 2012).

Arts and artefacts have also been found to be related to how norms are developed and adhered to in communities, which is a key aspect in the psychology subfield of social psychology. Social Psychology deals with understanding the influences of society in terms of norms development. The development of arts and artefacts is described as the place where the past meets the present (Bauer, 2008). He explains that a societal constitution of artefacts allows for routines that are acceptable, leading to viewing artefacts as a continuation of the politics in the society since possession of art and artefacts may indicate individual social statuses. As norms go through a cycle of change to obtain legitimacy, so do artefacts.

The study seeks to illustrate that ITK remains instrumental in socio-ecological decision-making. Although Opaluwa *et al*. (2012) insinuate that sustainability was achieved in ignorance, the current study emphasises that the development of art and artefacts was purposive and informed by previous experience. The indigenous people coexist with their environment as they are governed by the concept of *ubuntu* (Mashoko, 2021). *Ubuntu* philosophy shapes behaviours and attitudes of the communities by emphasising the interrelations between nature and people.

CONCEPTUAL FRAMEWORK

The designs and use of African art and artefacts are informed by what is important for the continued survival of communities. Arts and artefacts are fully embedded in the ways of life of the African people, including the development of group norms. Concepts from the implicit theories of intelligence and social psychology were adapted to inform the current article. Implicit theories of intelligence illuminate the idea that intelligence is not only a cognitive aspect, but also a social one (Mpofu *et al*., 2012). Implicit theories of intelligence posit that communities shape and encourage the development of traits that are important for the communities. This includes the ability to understand one's ecosystem and social environment.

Indigenous communities are dynamic and their behaviours are governed by socially acceptable rules and principles decided upon by communities. Concepts to explain this dynamic perspective and adherence to the rules are derived from Social Psychology. Norms in Social Psychology are viewed as a vehicle of change. The norms determine the patterns of interaction and a sense of social identity. Development and adherence to these norms have been linked to the development and use of artefacts (Piekarski and Wachowski, 2018). This concept defines how rules and norms that are adhered to are governed by the socioecosystems principles of a sustainable coexistence.

LITERATURE REVIEW

The literature reviewed in this current article focuses on the indigenous principles governing the development of tools and equipment used in indigenous communities. The literature revealed the convergences in ITK and how implicit theories of intelligence are defined. Arts and artefacts inform the way of life of individuals in a community in terms of attitude development, knowledge establishment and social relations among community members.

_Design‘ can generally be viewed as a verb or a noun and understanding design as a process opens gateways to comprehending the design process as a way of solving problems (Tetteh, 2013). Artefacts are objects with historical or cultural importance that are created by a people (US History.org, 2016). Smith and Kotze (2010) qualify artefacts as a product of the community that reflects how institutions mutually coexist for instance, therefore, what an artefact means depends on the individual yet this may have an impact on the community systems. Where artefacts are produced in mass, they may become social objects and standardisation breeds some norms in their production as well as their use (Piekarski and Wachowski, 2018). Understanding design as a process is key as people learned from past crises to adapt to their changing environments in a bid to attain sustainable coexistence by minimising negative impacts on the ecosystem and increasing efficient use of available resources. (Benjamin, 2006).

The artefacts in the discussion include the environment, buildings and public places (Piekarski and Wachowski, 2018). Rugwiji (2019) refers to a ―collective cultural landscape‖ to explicate how communities interact with their environments. Indigenous architecture proved to be done through high levels of sensitivity for the socio-ecological system which was informed by indigenous knowledge systems (IKS.) IKS inform how the communities are part of the world that is alive around people, viewing humans as counterparts of nature, thus presenting a complex and holistic system (Reitsma *et al.*, 2019). The design of artefacts enables communities to integrate with their natural settings (Benjamin, 2006). This means architecture

on the continent must be analyzed holistically, giving thought to its socio-ecological context (Mhlaba, n.d).

Mhlaba (*ibid.*) contends that culture determines how African architecture is spatially organised, further highlighting how diverse and dynamic culture is. Architecture is described as a symbolic language defined by nature and how individual communities responded to it, making the articulation of elements of weather like sunlight and protection from rain, while considering the vegetation and ground forms and surroundings, the essence of architecture (Ahmed and Suman, 2014).

Art is key in African lives because it serves as a means of communication, expression of religion and sociocultural norms and it varies from culture to culture (Opoko *et al*., 2016). How objects appear physically and their uses are intricately connected to the values of communities in terms of religion, social and moral arenas and how aesthetics express the notions and aspirations that people have on their environment, including ways of life in general, since the art of Africans mingles fully with their way of living (Opoko *et al*., 2016; Tetteh, 2013). Siegman (1980) observed that art in Africa is mainly symbolic rather than archetypal and symbols possess rich meanings that are complex across contexts, for instance, colours are used as decorations or ritualistic worship, among others, and these colours mean different things to different peoples and cultures (Adewumi and Faida, 2017).

The rural landscape is important as a preserve of culture, values and community traditions and the community was viewed as the custodian of the individual (Umali, 2018). Through ITK, how some domestic tools and utensils were designed, fostered their usefulness and endurance to maximise the sustainable use of the land and its resources at minimum costs. Physics principles, like the centre of gravity and centre of mass, were found to be useful in the making of clay pots and mortars, for instance (Mudzamiri, 2019). Taboos were also set in some communities to forge morality that allowed for the sustainable use of the environment (Chemhuru and Masaka, 2010) and for setting rules on design and manufacture processes that ensured equitable distribution of labour and responsibilities among the populations (Gosselain, 1999).

Implicit theories of intelligence explain how people construct and interpret the elements that makeup intelligence (Wambugu, 2006). Although there is no consensus on what intelligence is, it is key to note that cultures and subcultures determine how intelligence is viewed (Cocodia, 2014). Social aspects of abilities in people are important to Sub-Saharan communities (Serpell, 2007 as cited in Mpofu *et al*., 2012). Dispositional and social intelligence and social responsibility were found to be key components of intelligence, together with creative ability, including artistic expression as long as they were viewed as important in upholding community values, where considerations were made to the environmental demands
(Mpofu *et al*., 2012).

RESEARCH METHODOLOGY

A narrative review was selected for this treatise because it has no predetermined search strategy (Demiris *et al*., 2019). The researche aimed at providing a detailed synthesis of previous research on the aspects that govern the creation and use of African art and artefacts. A narrative review is more flexible as compared to quantitative reviews that use narrowly defined parameters. The narrative review also affords the researche the opportunity for speculation and creativity to afford the identification of more areas for future studies. A Google and Google Scholar search of articles led the study to various articles on art and artefact design and how they were useful in developing new technology and new study curriculums across varying levels of education. Abstracts were read to further screen articles.

Themes were identified using thematic analysis in the articles selected using the Braun and Clarke (2006) framework to ensure credibility and dependability of the article (Maguire and Delahunt, 2017). The recurrent themes ―adapting to the environment‖ and ―creation of social norms‖ pointed the research to search for psychological articles that clarified implicit intelligence theories and social psychology and norms creation.

RESULTS

Two main themes were identified. The first was ―design as evidence for implicit theories of intelligence‖ and the second was ―art and artefacts in Africa as a driver for social norms‖. Under the theme design as evidence for implicit theories of intelligence, subthemes included optimal use of strengths and minimisation of weaknesses as a sign of intelligence, design as a

process of adaption, design of artefacts for functionality purposes, creation of environmentally suitable artefacts as a sign of intelligence and design as a component of social intelligence and social responsibility. The subthemes under the main theme ―art and artefacts in Africa as a driver for social norms‖ included the design product as a source of social norms, design as a process of creating elite power, design as a sign of social status and design as a process to ensure equitable role distribution.

Evidence was gathered from African countries including Egypt, Zimbabwe, Nigeria and Kenya. The evidence included architectural designs of homesteads buildings and art creation together with artefact design and their uses. The analysis took into cognisance the products of design and their processes. Some of the themes were found to overlap but care was taken to include findings under their most suitable theme.

DISCUSSION

DESIGN AS EVIDENCE FOR IMPLICIT THEORIES OF INTELLIGENCE

Implicit theories of intelligence in the field of psychology give a varying perspective from how the West defines intelligence as a factor devoid of the social context (Mpofu *et al*., 2012). How Africans define intelligence gives importance to the social aspects that they value in their lives, for instance, staying in harmony with their ecology, since they believe their ancestors live in nature and that the living is connected to their dead relatives. These aspects are evident in traditional communities, as they harness nature elements to create comfortable dwellings for their communities. Evidence was found in all articles read in writing this study that communities utilised resources that were readily available in their surroundings and relics did not disrupt the ecosystem but, instead, blended with nature (Smith and Kotze, 2010; Opaluwa *et al*., 2012). Straw bales, for example, absorbed noise and were known to provide thermal comfort (Opaluwa *et al*., 2012). These could be grown by farmers and were abundantly available and useful without emitting destructive gases into the environment. Social responsibility and social intelligence were also components that the Shona depicted as part of being intelligent.

OPTIMAL USE OF STRENGTHS AND MINIMISATION OF WEAKNESSES AS A SIGN OF INTELLIGENCE

Over generations, ITK developed to take advantage of strengths in the individuals and the environment, while reducing the impact of environmental and individual weaknesses. The Karanga believe nature consists of the physical world, the landscape and the forces that control these with the power of this nature being evident in diseases and death, droughts and floods that were interpreted as a bad omens (Pikirayi, 2013). Implicit intelligence theories posit that cultures value and encourage abilities that help communities live sustainably in their environments and ITK may have been used to encourage and share knowledge on lessons learnt from past generations to inform how future generations then interact with the environment. By using ITK to inform how to design their artefacts, therefore, the traditional communities were tapping into their intelligence which arose from learning lessons from their ancestors of what worked for them and what did not. Emphasis was thus made to encourage those aspects that enabled community coexistence and adaptation to nature. For instance, the shapes and designs for the mortar, the round huts and the conical huts, for instance, were not random and uninformed developments but were informed by the need to make the artefacts functional and this knowledge and skill was passed on and promoted through generations (Mudzamiri, 2019).

Nigerian Yoruba buildings are constructed from locally abundant materials and the houses have evolved in response to socio-cultural and climatic demands (Opoko *et al*., 2016). Domestic Yoruba architecture has three major categories which are palaces, chief and titled men residents and the more humble and ordinary people‘s dwellings (*ibid.*). The quality of artistic expression and the size of the homes distinguished the houses, whilepolishing the walls protected mainly the walls from erosion and was for aesthetics (Opoko *et al*., 2016). The more affluent in the community adorned their homes with carved caryatids (*ibid.*).

DESIGN OF ARTEFACTS FOR FUNCTIONALITY PURPOSES

When domestic tools were designed, deep thought was given to how they may attain their functionality. For instance, the mortar is shaped with a broad base to make it stable. The conical shape also ensures stability is maintained and that centre of mass lies within its base. The pounding must be done through the mortar‘s centerline to make sure the mortar does not topple over (Mudzamiri, 2019). The force applied to the centre of the mortar does not result in a turning effect of the artefact.

The *guyo* needs a rough surface to be able to crush grains using frictional force and the round hut endured the mechanical equilibrium of the structure all the time (*ibid.*). The roof's shape needed to maintain zero torque and zero resultant force so as not to damage the hut, hence careful considerations in ensuring the wind force and the weight of the material used to make the roof did not exceed the force of the building structure as a whole. Using the conical shape ensures airspeed is higher around the roof than that in the surrounding area which produces low pressure underneath the roof, thus balancing the downward pressure of the roof. Without this balance, the roof may be lifted by the air, a great danger to the community.

Clay pot shapes and sizes vary, depending on their purpose. The Luo people of Kenya use clay pots to store water because of their evaporative cooling effect (Mwiandi and Ombaka, 2017). In Zimbabwe, *shambakodzi*, the pots used for cooking *sadza* have huge bellies to accommodate large volumes of *sadza* to suit the demands; the mouth is wide to allow for ease of stirring of the *sadza*; the pot is not painted due to soot; the *hadyana* is for relish and it is smaller to cater for smaller quantities required to feed a family as compared to *sadza*; *mbiya* is used to serve food and it is painted and small since it serves as a side dish; the *gate* is big-bellied with a wide neck since it is used to brew beer and cook maize and other foods like *nyimo* and *mutakura*; *pfuko* is used to store *maheu* and beer and it has a narrow long neck, is painted and has patterns and drawings on it; *hwedza* is used to keep milk and it is wide-mouthed so that it receives the milk well, while *hodzeko* is used to keep the milk until it is ferments; and *chirongo* was created light in weight to make it manageable to fetch water (Brazier, 2020). The oval shape of the clay pots allows for the larger volume of the pots, keeping the central gravity low, thus maintaining unstable equilibrium (Mudzamiri, 2019). All these variations in the artefacts arose from the need to ensure the artefact served the purpose that it was created for adequately.

DESIGN AS A PROCESS OF ADAPTION

Community lives were not static but changed over the years, according to the need to adapt to their ever-changing environments. Great Zimbabwe was built in different stages (Ahmed and Suman, 2014). The Hill Complex was not built based on a preconceived plan, but evolved with time and the Great Enclosure walls follow a similar trend (Pikirayi, 2013). Pikirayi notes that the town took three centuries to construct. The impression attained from these findings is that over hundreds of years, people modified their settlement, depending on what nature presented along the way. A volcanic eruption is believed to be responsible for the flat shape of the rocks

used in the construction of the monument and veld fires may have separated them from the main rock, meaning the availability of materials to use may have varied over the long period and the community had to adjust the wall‘s designs according to their community developments and well as environmental changes.

In Egypt, when the land was in flood, farmers became builders (US History.org, 2016). Egyptians believe in the afterlife and so they built the Great Pyramids as impressive tombs of powerful pharaohs. The Sphinx was designed to watch over the pyramids with a human head on a body of a lion, symbolising immortality. The size of the pyramids was meant to accommodate the pharaohs and their possessions and, initially, the pharaoh‘s slaves and animals were buried with him (*ibid.*). However, since burying the pharaoh with their slaves and animals later proved to be costly, art was used instead to depict human activity on the inside walls. Art, in this case, was used to adapt to a huge cost that the community could no longer handle. To protect the pharaoh‘s remains from defilers, the hardest stone blocks were used to make a huge coffin.

CREATION OF ENVIRONMENTALLY SUITABLE ARTEFACTS AS A SIGN OF INTELLIGENCE

Principles in the discipline of physics seem to have been considered, although no formal education was attained in the development process of these artefacts. In creating the yoke, a wooden beam that is used on a pair of oxen to enable them to pull a load used in agriculture, for example, it is considered that the two forces from the animals are in opposite direction to produce a momentum that has a turning effect at the middle point of the yoke, if the forces are thus equal, they prevent the yoke from turning at the centre (Mudzamiri, 2019). Mudzamiri also gives an example of the conical shape and the angle of the roof which ensures raindrops are projected away from the hut to prevent the water from wettening the pole and daga structure to prevent its weakening and eventual collapse in addition to preventing the structure from developing mould which can result in illnesses.

Farmers in Nigeria made use of locally manufactured hoes suited for their terrains and soil structures to the extent that a hoe designed in the North may not have been adequately useful in the South (Asoegwu *et al*., 2018). Key considerations made for the hoes were mainly

ergonomic. These hoes proved to be efficient as they could reduce labour by 50% in rice fields weeding (*ibid*).

The traditional plough is made of wood, is animal-drawn and can at times have a metal share point (*ibid.*The handle is used to guide the plough. In key deliberations in choosing the most suitable power source and ideal equipment in processes including tilling, planting and weeding, the farmers consider local factors of availability, accessibility, affordability and acceptability. To complement these key considerations, the source of power and the equipment used would be in tangent with the user‘s knowledge, skill, experience and must be available to complete the task on time, providing operational and financial sustainability.

For sustainable production in Agriculture, there is a need to conserve the environment and so implements must be effective and sustain fewer oxen (Gebregziabher *et al*., 2006). The simpler support systems for animal draught technologies and their indigenous nature allows for ease of integration with the systems of the small farmers. For instance, the *ard* from Ethiopia is light and can be transported by one person across the field, the *marasha* is created from wood, which is readily available in the communities and has low maintenance and is well suited for a variety of oxen. These ploughs are designed to be effective in the ploughing task to be comfortable for the animals and easy to use for the farmers. Italians tried to introduce a heavier and more complicated plough, requiring higher power as it was heavy and was rejected because no consideration was given to the farmers‘needs and requirements
(*ibid.*).

The house windows of Yoruba homes are small in nature and are placed high above the ground as an anti-burglary measure to deter unwanted intruders and to control the chilling weather in the rainy season and Harmattan. An impluvium systems design is used to enable the collection of rainwater for domestic use and as a way of reducing erosion which may be caused by the rainwater which falls off the roof. For more security, the buildings are arranged in a square, joined at corners with the roofs terminating to allow the collection of water (Àmọle and Fọlárànmí, 2017).

In the Zambezi Valley, the BaTonga constructed stilted huts for shelter to keep away from the scorching sun, floods and wild animals (*The Patriot*, n.d). The stilted huts have evolved due to climatic changes that prevailed in the valley, indicating how the people were dealing with the

climatic changes by selecting a proper design and proper materials to use in the construction sector was taken to use of strong wood like mahogany and teak which to escape the floods on the flood plains of the Zambezi River with much higher poles closest to the river. Traditional herbs were rubbed on the poles to repel ants and termites.

In some other parts of Zimbabwe, the *dura* (granary) is built on large stones to allow air circulation which then prevents the attack of the harvested crops by termites and ironwood poles were mostly used because the wood repels pests (Brazier, 2020). Cow dung smeared on the walls using a smooth pebble (*nhombo*) made the polishing waterproof and smooth. The use of cow dung and, at times strongly scented plants like *zumbane*, keep the pests away from the harvest. The granaries of the BaTonga were honeycomb-shaped, storing different grains for years. The trees used to design and create the granaries were thoroughly treated with oils from reptiles to deter animals from coming closer to the granaries.

Traditional architecture in Africa is sustainable and has evolved to suit its communities as all resources to build houses, including timber, straw bales and grass have been readily available in the environment (Opaluwa *et al*., 2012). African intelligence favoured the maximisation of strengths and the compensation of inadequacies both in the individual and the environment they reside in (Mpofu *et al*., 2012). Africa‘s architecture ensured resource use neither diminished availability nor undesirably affected the ecosystem balance.

In Zimuto, artefacts are created using raw materials available in the local areas using very simple tools and evidence of special skill is found in the process (Mudzamiri, 2019). Opaluwa *et al*. (2012) found how ruins of buildings in Somalia, as in many other parts of Africa, indicate a sense of prowess in the builders, and how Africa was rich in highly skilled populations, evident in the Pyramids of Egypt. The construction of Great Zimbabwe was also no exception as the walls were built without mortar, using flat slabs of rock that merged with the boulders and rocky surfaces present in the area as if nature was being harnessed, peacefully to create a majestic settlement that was comfortable for the Shona people (Pikirayi, 2013; Rugwiji, 2019).

All this knowledge is evident in ITK. Pygmies built the simplest houses shaped as beehives from bendable branches covered with huge fresh leaves to suit their nomadic lifestyle (Ahmed and Suman, 2014). People who did agriculture, on the other hand, built more permanent homes

from thick mud and sturdy bamboo frames (*ibid.*). This is evidence that each community considered its context and came up with designs that were best suited for their situations which entails an element of dispositional intelligence.

DESIGN AS A COMPONENT OF SOCIAL INTELLIGENCE AND SOCIAL RESPONSIBILITY

In defining intelligence, the Shona mentioned social responsibility and social intelligence as key components of intelligence (Mpofu *et al*., 2012). One aspect that stood out in the designs of artefacts was how the roles were defined along the process of design, giving individuals in the community roles to play. How artefacts used in traditional African communities were designed seems to support the notion that African communities view social and intellectual abilities as intelligence (Cocodia, 2014).

This social intelligence included keeping the spirits of their ancestors appeased by living in harmony with their surroundings. In building a Yoruba homestead, the design and building process is done with community help (known as owing) and labour is subdivided among the members. Even the children are accommodated in the tasks as they carry made-up building materials to building sites (Àmọle and Fọlárànmí, 2017). The owner of the homestead had a social responsibility to feed and entertain the community helpers.

Since the *ubuntu* philosophy promotes the existence of individuals within their communities (Mashoko, 2021), a workforce was available in the community (Opaluwa *et al*., 2012). This inclusion of social aspects of communal work and distributing tasks according to capability, ensured a sense of community that was an important African value, which was a key factor in the implicit theory of intelligence according to traditional African cultures.

THE SOCIAL PSYCHOLOGY OF ART AND ARTEFACTS IN AFRICA Arts and artefacts were implicit in African culture as they define norms across various sectors of life. Norms are key in group dynamics as they determine the social behaviours of individuals in a group setting. Inherent in the role art and artefacts play in social psychology is the creation of norms that community groups abide by. Walking sticks, for instance, are walking aids, but they are used for tribal dances as they have symbolic meaning. They were traditionally used as clubs in wars and against animals, in addition to holding ancestral spirits, giving them a unique

religious value (Victoria Falls Guide, n.d). These various aspects of walking sticks define how they are designed. The snake carving is a powerful symbol for the *svikiro*, humans, who when possessed communicate with the *mhondoro* (spirit of the tribe).

ART AND ARTEFACTS IN AFRICA AS A DRIVER FOR SOCIAL NORMS Though technology is useful in art and designing of artefacts, it is not impartial politically (Foxhall as cited in Rugwiji, 2019), thus there is need to fully understand the dynamism of the control of resources in African societies and how this affected the process of creation of art and artefacts. The structures of Great Zimbabwe city communicated wealth and political power which enabled the long-term construction of the monument and availability of abundant resources, even in human capital (Rugwiji, 2019). The Great Zimbabwe nation was found to be a large kingdom which may have had 18 000 residents (Ahmed and Suman, 2014; Rugwiji, 2019).

The conical tower symbolises the dominance of men which spoke of the patriarchal nature of the Rozvi dynasty, who are believed to have built Great Zimbabwe, while the number of huts communicates the polygamous families and how they were organised, allowing the architectural designs of the homesteads to give an insight on the communal organisation of the ancient nations (Rugwiji, 2019).

In terms of religion, birds were traditionally believed to be messengers and the *hungwe* (fish eagle) indicates an appropriate messenger for powerful and important peoples of Great Zimbabwe since it is the biggest and most powerful birds (*ibid.*). The bird signified the importance of religion to the inhabitants of Great Zimbabwe, as it was believed to pass messages between people and the creator. The Yoruba are no exception in using art and artefacts to establish the norms in their religious processes. Their art is deeply entwined with their lives to the extent that one author claimed understanding the Yoruba was incomplete without the study of their arts and sculptures and figurative sculptures of the Yoruba are useful for religious purposes and everyday use (Àmọle and Fọlárànmí, 2017).

DESIGN AS A PROCESS OF CREATING ELITE POWER

Spatial segregation in Zimbabwean tradition involved the separation of the elite from the commoners in their residential designs and the setup of the stone architecture at Great Zimbabwe was not only a reflection of the existence of the elite in society, but an indicator of the process of creating the elite power (Pikirayi, 2013). The wall decoration and the features

of architecture symbolise the presence of royalty and a sacred place for holding rituals (Garlake, 1973, as cited in Pikirayi, 2013).

The architectural developments and designs involved the manipulation of the natural environment to accommodate human settlements. Architecture thus had to combine the natural power of the environment, viewed as a link to the ancestral world (Pikirayi, 2013). This means constructing Great Zimbabwe was a process that involved the construction of social and political power through the use of ideology, thereby producing social roles, not merely a reflection of them. How then social power and ideological concepts were linked were shown in the architecture of Great Zimbabwe where the walls extend and highlight the natural landscape and its features (*ibid.*). Connections with the cultural landscape that was normally out of reach of the humans were made.

DESIGN AS A SIGN OF SOCIAL STATUS

The Yoruba live in FAMILY compounds.Social background and social order were key considerations when the homesteads were designed. Their compound structures can be round or rectangular, being politically and socially organised with the compound being the family focus. The courtyard of the Yoruba homestead signifies the individual matrimonial family unit, while at the same time indicating they are a part of the extended family and the community at large as the population can depend on the family resources to work on their land (Àmọle and Fọlárànmí, 2017). The family compound signifies the security of the family given that to be rich, the family compound needs to keep expanding, showing the family is growing. The structures were thus built primarily to support the social and religious ways of the Yoruba people (*ibid.*). Ceremonies to guarantee the renewal of buildings were engrained in the communities'socio-cultural practices (Opaluwa *et al*., 2012).

For the Yoruba, how a house is decorated indicates the social status of the family and decorations at shrines and palaces are more elaborate to give a spiritual and symbolic interpretation of the art and design (Àmọle and Fọlárànmí, 2017). For example, the size of the palace is indicative of the size of the kingdom and its population. The palace is a symbol of wealth, prosperity and belief systems. Yoruba buildings are thus a reflection of what they believe in, not in terms of the security provided by the walls themselves, but in the protection obtained from entrusting in the deities they have pledged allegiance to.

DESIGN AS A PROCESS TO ENSURE EQUITABLE ROLE DISTRIBUTION Women made pots while men manufactured iron using clay furnaces (Brazier, 2020). Many taboos were linked to the making of clay pots and they may have served to create a trade that was suited for a specific class of people in the societies. For instance, menstruating and pregnant women were forbidden from using the clay pots and girls in puberty were not allowed to attend some stages of pot-making or at times make some pot categories, or even make decorations due to the fear that they may become infertile (Gosselain, 1999). This served to exclude men and younger women and girls from partaking in pottery while encouraging post menopause women and widows or abandoned women who faced harsh economic situations (*ibid.*). Artefact creation in this instance was key in encouraging a norm of protecting the livelihoods of a group of vulnerable members of the communities.

Similar concepts were found in the use of ―*zviera*‖ in the Shona culture where communities use them to foster a moral compass in the people (Chemhuru and Masaka, 2010). Zivera encourages conformity to norms established within society. For instance, Chemhuru and Masaka (*ibid.*) mention it was taboo to go to a well with a dirty clay pot because this would anger the water spirit. This taboo served to keep the water sources clean from pollution. How morality is understood is preferred by the African communitarian perspective of humans where one‘s actions are viewed within the context of the community. The Shona, just like other African tribes, thus transmit social values that are key in the development of the societies they live in. Enforcement of taboos depends on that noone questions the scientific explanations behind them but instead, society holds them as sacred, thus no need to doubt them (*ibid.*).

CONCLUSION AND RECOMMENDATIONS

This article managed to bring out how indigenous technical knowledge is related to the concepts of intelligence according to how African traditional communities define intelligence as both a cognitive and a social construct. It shapes how individuals relate to each other and the environment. Individuals are concerned with the sustainable and mutual coexistence of the environment and humanity. Over years, relevant information was gathered on how to engage in sustainable coexistence between people and their environments and this information was passed through generations after communities believed it was relevant and important to them. The design and use of artefacts were found to depend on what communities viewed as

important in their ways of life. The design of arts and artefacts is also important in understanding human behaviour by giving rise to norms and systems that are acceptable and key to the survival of communities. Taboos were among social rules employed to preserve and foster adherence to the way of life of indigenous communities.

In the same manner that indigenous communities learnt from their predecessors and adapted to changes, in the modern world, lessons can be drawn to care for the environment as the indigenous peoples did and local intelligence be used to preserve both communities and the environment. More studies need to be done to document the modifications to ITK, given that they are not static. More studies need to be done on how the ITK can be merged with advances in technology for the production of a more sustainable way of living. Modern communities need to be able to identify abilities inherent in their people and to optimally use them to coexist with the communities.

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