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Indigenous Education System and Environmental Conservation Initiatives for Sustainable Development: Experiences from Nyamwezi in Uyui District, Tanzania

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Abstract

For centuries, African communities in their localities have co-existed with their natural environment in a harmonious manner leading to sustainability of both, the humans and the natural resources base. This co-existence is enabled by what is referred to as the indigenous environmental knowledge system. Indigenous knowledge has always been transferred from one generation to the next through norms, stories and cultural practices. This paper explores Indigenous Education systems and their implications to the conservation practices of the environment in Uyui district in Tabora region. The paper dwells on both primary and secondary data to provide insights on how Indigenous Education Systems embedded with traditional, initiation and local religious affiliation, have been used since time immemorial as one of the indirect initiatives of preserving, protecting and managing natural catchment forests. Random, Snowball and purposive sampling techniques were used to get a total of 120 respondents for this study. The study revealed that local communities in Uyui district have their system of knowledge affiliated with traditions, rituals and taboos which have been used to protect environmental and natural resources since the pre-colonial era up to the post-colonial epoch in Tanzania. The majority of respondents argue that the indigenous knowledge system was practical in protecting the natural resources in the local areas as it was embedded in the taboos, traditional rituals and religious beliefs. Failure or abandonment of the indigenous traditions has led to mismanagement of forest resources and other natural resources. The paper recommends both local and central government incorporate Indigenous knowledge and experiences in their endeavors of protecting and preserving the Environment in Uyui district in Tabora region for sake of sustainable development in Tanzania.

Keywords: Indigenous Education Systems, Traditional and Rituals, Environment, Sustainable development, Environmental conservation
INTRODUCTION

Indigenous and local people all over the world, particularly in developing nations, have developed ‘a science’ through the annual cycles of subsistence activities that have given rise to knowledge systems and technologies helpful in preserving the natural environment within such a community (Burgos-Ayala et al., 2020). As a result, over time, local communities have amassed a wealth of knowledge about local flora and fauna. They have also created their classification schemes, as well as adaptations of meteorology, astronomy, pharmacology, physics, biology, and the sacred, also known as the inner world (IPCC, 2014). However, it has been a continuing struggle for indigenous communities around the world to uphold their rights, traditions, and knowledge in a system that is heavily influenced by Western knowledge system. Indeed, Indigenous knowledge is not just the ‘knowledge component’ but the way of life of the local people in their local environments, and therefore cannot be separated from the people who hold it (McGregor, 2021). Consequently, the promotion of sustainable development and environmental management, particularly in rural areas, benefits greatly from the inclusion of indigenous populations and their indigenous knowledge (Brondizio & Le Tourneau 2016; Lam et al., 2020). Indigenous education places a strong emphasis on learning practical skills and acquiring knowledge that is beneficial to the individual and society. It is also concerned with the systematic socialization of the younger generations into the norms, religious and moral beliefs, as well as the collective opinions of the wider community. Similar to the native Alaskans, the Ogiek of Mau Forest each had their unique perspectives on the world, the cosmos, and one another. The Ogiek people in Kenya continued to uphold the communal nature of knowledge and the idea that riches should be shared for the good of all (Towett, 2004).

Indigenous knowledge systems (IKSs) come in many different forms, and they have been used by communities in Africa and the rest of the world for a variety of requirements since the dawn of time (McGregor, 2021; Burgos-Ayala et al., 2020). To engage in agriculture and other activities that assure their comfort and subsistence, a significant portion of traditional cultures in Africa still rely on indigenous knowledge that has been passed down from generation to generation (Chikaire et al., 2012). The degradation of the state of the earth and awareness of indigenous communities’ sustainable way of life has recently piqued the interest of the international community in indigenous knowledge and practices.
Thus, Indigenous peoples and the surrounding communities have deep connections to their natural surroundings. Through the ages, they have amassed a comprehensive body of knowledge that has enabled them to sustain a balanced social-environmental structure. They have also triumphed over numerous crises and obstacles, such as shifting livelihoods, shifting climate and ecosystems, and changing resource use and availability (Pearce et al., 2015; Berkes, 2018). According to a study by Eneji (2012), indigenous natural resource management techniques have developed as a result of historical interactions between communities and their surroundings, giving rise to customs and cultural landscapes like sacred groves and forests, sacred corridors, and a variety of ethno forestry techniques. Indigenous environmental knowledge is not stored in books; rather it is retained and transmitted through the indigenous education system mostly verbally, through subsistence practices and cultural myths and taboos (Obiora and Emeka, 2015).

Indigenous education’s potential contribution to improving understanding of sustainable development was sparked by the UN Conference on Environment and Development in 1992. It brought to light the pressing requirement for creating systems to safeguard the biological diversity of the planet using local knowledge. To achieve sustainable development, Agenda 21 of the UNCED conference placed a strong emphasis on the need for governments to work toward integrating indigenous environmental management knowledge systems into current socio-economic development programs (Helvetas, 2011; Gaillard & Mercer, 2013).

Indigenous groups view education as a way to learn from life's experiences. Through methods based on learning by doing which include observations, actions, and interactions with both adult members of the community and the environment (UNESCO, 2009), they thus ensure that the individual is adequately prepared to become a member of their community. Indigenous groups view education as a way to learn from life's experiences (Kanstrup-Jensen, 2016).

It is important to note that Tanzania's indigenous communities for many years have used indigenous knowledge to utilize their natural resources in a communal manner, and this practice has promoted the sustainability of those resources in their surroundings. The Iraqw people of Northern Tanzania in Tanzania, for example, have excellent traditional knowledge
of how to utilize the environment and resources in their entirety. They separated the many use zones in their landscape (Lawi, 2002). According to Nyanto (2015), indigenous practices and beliefs have historically played a significant role in protecting natural resources like land, water, and natural forests in western Tanzania. Africans did not completely abandon their traditions, even though they were reviled. Natural woods are revered and viewed as sacred spaces throughout Tanzania and the rest of Africa because it is thought that they are the homes of ancestor spirits, thence people are not allowed to conduct any activities around those areas. The majority of locals in Africa continue to conduct traditional worship in natural forests despite the influence of modernization (Mangizvo, 2013). This study sought to explore how the Nyamwezi community of Tabora region, Tanzania, has been using the indigenous education system to conserve their environment for the sake of sustainable development.

This multidimensional study is based on two theoretical views, namely; the institutional theory and social learning theory. Institutional theory is a collection of conventional reasoning, normative and regulative elements, organized and associated with activities and resources that bring depth and meaning to communal life. Scott (2004) claims that institutions are social entities that attain resistance and flexibility. The theory considers the procedures by which institutions and societies are embedded with customs, guidelines and plans that come to be recognized as authoritative standards for social conduct. It also considers the processes through which agreements made up of rules, norms, and practices become accepted and followed (Scott, 2004). Social learning theory, on the other hand explains how people learn social conduct through seeing and copying the actions of others. The social learning theory was developed by Albert Bandura as an alternative to the previous work of Skinner, whose explanation of learn as a result of reinforcement of behavior. Unlike Skinner, Bandura argued that people can learn behavior through observation. He asserted that learning happens as a result of responses based on experience and directly seeing the unique effects on the communal and social mood of other members of the public. These theories are significant in this study as they do expose how indigenous education can be transferred from one generation through apprenticeship, and community discourse through oral tradition.
Studies conducted in this area mainly focused on indigenous knowledge and the protection of natural forest resources (Sanga & Haulle, 2022). However, the role of indigenous education and the preservation of the environment by using local recollections for sustainable development is missing. Therefore, to fill this knowledge gap, this study probed and explored Indigenous Education systems and their implications in the conservation practices of the environment in Uyui district in Tabora region.

**METHODOLOGY**

A case study design was used in this study. A qualitative approach was employed to collect and analyse data. The paper used both primary and secondary data to collect tangible facts on how Indigenous Education Systems have been used as one of the indirect initiatives for preserving, protecting and managing natural catchment forests. Snowball and purposive sampling techniques were used to get a sample of 65 respondents. The selected respondents consisted of elderly with 65 years and above who comprised senior elders, religious leaders, pastoralists, hunters and peasants, both females and males. The main instruments that were used to collect data were unstructured interviews, focus group discussions and observation. The observation was used to supplement the interview schedule and was administered in conjunction with it.

**THE STUDY AREA**

The study was conducted in Tabora region in Uyui district. According to the 2022 Census report, Tabora region has a total population of 3,391,679 people, where males are 1,661,161 and females are 1,730,505 with average growth rate of 3.9 per year. The region has a total of 598,659 households, with an average household size of 5.7 (URT, 2023). A territory in the current Tabora administrative region is referred to as Unyamwezi. Tabora was chosen because it is among the regions endowed with plenty of natural forest resources, which have been preserved and managed through rich indigenous education systems that have been used since time immemorial. The most prevalent ethnic group is the Nyamwezi, the Konongo, Sumbwa, and Kimbu are among the minor ethnic groups that live in Unyamwezi region. All these ethnic groups learn the conservation of natural environment through traditional practices and initiation ceremonies.
Indigenous Education System and Environmental Conservation Initiatives for Sustainable Development: Experiences from Nyamwezi in Uyui District, Tanzania

Paschal J. Mheluka and Reguli Baltazar Mushy

Figure 1: Map of Tanzania showing the Tabora region.
Source: Google map.

FINDINGS AND DISCUSSION
Indigenous Knowledge and Environmental Conservation Initiatives
The study sought to explore how indigenous knowledge has been used to protect, conserve and manage natural forest in Uyui. Specifically, the study explored how indigenous knowledge has been used to protect and conserve natural forests; sacred areas; and totemic and how it has been used to combat fire.

How Indigenous Knowledge has been used to Protect and Conserve Natural Forests
Local communities in Uyui district have been using Indigenous knowledge as one of their initiatives to conserve the natural forests in
their areas. This, in turn, has played a great role in protecting and preserving the environment in Uyui district. The study has found that 51% of the interviewed key informants affirmed the existence of indigenous practices of planting natural trees which are very scarce and valuable. Uyui district is one of the areas where valuable natural trees for timber can be found. Local communities in Uyui district do have tradition traditions of rejuvenating natural trees which appear to be diminishing. One of the elders argued that:

*The families that have trees such as ‘Mninga’ and ‘Mkora’ in their farms are very respected in the community. They are taken as good examples and if one wants to marry, he or she would prefer a partner from a family with those types of trees, with a belief that the children must have strong knowledge that can sustain the new family.*

Hence the traditional knowledge of planting and preserving valuable natural trees in Uyui become a symbol of power and prestige and at the same time, contribute to sustainable development to Tabora region (Plate 2).

One of the participants in the focus group discussion asserted that:

*Although we are capable of replanting very precious natural trees known as mninga, those trees which are essential for timber products, we have the knowledge of replanting natural trees, those who concern with trees (mabwana misitu) and agriculture officers have never come to ask us concerning this practice, that implies we are being ignored as laymen who know nothing about reforestation* (Quoted one of the participants in the focus group discussion at Igalula in Uyui).

**Plate 2:** Natural tree (Mninga and mkola) in Uyui District in Tabora
Source: Field data (2023).
The above discussion implies that the knowledge and the practice of tree planting in Uyui district played a crucial part in rejuvenating natural precious tree resources which have diminished due to excessive timber demands. Even though the said indigenous and local people's illumination is essential for the protection and preservation of natural precious trees has been negated and not being incorporated by agricultural officers and those who are concerned with forest affairs in Uyui district.

How Indigenous Knowledge has been used to Protection Sacred areas in Uyui
The study found that indigenous knowledge is directly connected with the protection and preservation of sacred areas known as “Ikulu,” the areas were surrounded by local chiefs’/ancestors’ graves. 82% of the interviewed respondents asserted that sacred places were protected and people are prohibited from cutting trees, or engaging in any economic activity around these areas. Sacred areas have been used since pre-colonial and recently for praying and asking ancestors to provide rainfall and protect the Nyamwezi community against natural disasters such as locusts and drought. Local communities in Tabora been using many methods to maintain and conserve their environment; for example, elders forbade human activities in certain areas, such as ritual forests, and people were not allowed to hunt animals found in those areas for fear of angering ancestral spirits. Fishing was also prohibited in sacred ponds to avoid offending ancestors, who could then punish the society by sending various misfortunes like as floods and drought. One of the elders aged 90 said:

*Human activities such as gardening, hunting and grazing animals (cattle) are strictly prohibited in area surrounded by ponds or water bodies. It is believed such areas and spaces are sacred and are normally used to pray. People believe that any against harm or draught can be mediated in sacred spaces* (Interview with a female elder aged 90 years).

Indigenous knowledge is also to teach people on ways of combating fire. Also clearing the land using fire is considered as a taboo and local people are being taught to save particular species that were regarded as totemic symbols. (Interview with an 89-year-old elder, 2023 Fieldwork).

The indigenous knowledge in Tabora which is affiliated with ritual activities is synonymous with those of local people in Zimbabwe as affirmed by Manwa who argued that it is believed that ancestral spirits of the people live among the hills and those areas are being preserved and
eligible for human economic activities (Manwa, 2007). According to Hiwasaki et al. (2014) and Cunningham (2010), indigenous populations depend on their territories for the execution of social, economic, cultural, and environmental activities. These activities include sustainable production and consumption practices, resource conservation, and management strategies, the majority of which are based on traditional knowledge and customary systems of governance.

How Indigenous Knowledge has been used to Protection Totemic (Flora and Fauna) in Uyui

The study has found that 60% of the interviewed respondents testified to the existence of the practice of protecting totemic symbol in Tabora region particularly among the Nyamwezi community in Uyui districts. This was affirmed by the following Focus Group Discussions which were conducted at Kigwa B and Igalula ward. Respondents argued that some of the trees are being preserved and people are being warned not to cut them to avoid bad fortunes. For example, “Mputika” is associated with the death of relatives or siblings, and “Mmwaga” is associated with the separation of the family (divorce) (Plate 1). These illuminations about totemic symbols are imparted to the young generation through the narration of the stories by the elders. On the other hand, some animals such as hyenas, lions and porcupines are regarded as totemic thence local communities are prohibited from hunting them. One of the interviewed senior elder argued that:

*Some of the natural trees in Uyui are regarded as totemic since they tend to be associated with misfortune; for instance, “Mputika” is associated with death, so people are being warned not to cut them to avoid deaths in their families. “Mmagwa” is also associated with chaos in the family, which may end up with the family separation. Due to this traditional knowledge, local people in Uyui respect and protect those trees”*(Quoted one of the senior respondents at Igalula in Uyui).

Plate 1: Natural forest (Mitundu and Mmwaga) at Igalula in Uyui District
Source: Field data (2023).
The protection of totemic trees and animals is seen as the indirect initiative of preserving natural resources which in turn has profoundly contributed to sustainability of the environment in Uyui district in Tabora region. According to Eneji et al. (2012), the protection of totemic symbols includes the ideological, sentimental, respectful, and ancestor-based connections that certain individuals or social groups have with animals or other natural objects. Members of the Teso community saw these creatures and things as friends, family, protectors, ancestors, or helpers (Eneji et al., 2012). They were also typically given magical abilities and treated with a mixture of reverence, respect, wonder, and dread. Before Kenya gained independence, the African Mourning Dove, the Half-Collard Kingfisher, the Nubian Nightjar, and the Barn Swallow, locally known as Akabulutu, Amuruon, Asulwenyi, and Emelete, were held in high regard by the Teso people of Busia County. These birds were considered symbols for various clans and were also linked to good fortune. As a token of appreciation, none of the Iteso ancestors who revered the aforementioned birds as totems were able to harm, kill, or consume these birds. Additionally, some tree species were never cut down because it was thought that they were connected to water supplies, had therapeutic qualities, were ancestors, had terrible omens, or brought money and good fortune. For example, the fig tree known as Ebule in the area was thought to be spiritual and was a place where people in the community used to worship under, and felt protected and nobody was allowed cut them. Similarly, the Kigelia Africana tree, sometimes referred to as Edodoi in the area, was thought to have a successful mumps remedy; thence the mentioned protected symbol has contributed to the preservation of the environment among the Teso community in Kenya (Eneji et al., 2012).

How Indigenous Knowledge has been used to Combat Fire
The study found 90% of the interviewed respondents depicted the existence of indigenous education as being connected with the knowledge of firefighting among the Nyamwezi community since the large area visited by researchers showed the stability of the firefighting among the local people in Uyui. The existence of indigenous knowledge among the Nyamwezi community has played a great role in conserving the environment due to prevailing initiatives of combating and controlling the eruption of fire in Uyui district. Elders tend to transfer the illumination on how fire can be prevented and controlled in Uyui district. The
knowledge of combating fire has played a great role in conserving the environment in Tabora. One of the seniors responded said that:

*Fire is regarded as the first enemy of the environment and natural resources, thence community is urged to combat the eruption of fire together in their surroundings* (Quoted one of the senior respondents at Kigwa B in Uyui).

The above assertion indicates that indigenous knowledge in Uyui district is embedded with the initiatives of firefighting. The knowledge of controlling and combating fire has played remarkable endeavors in preserving natural surroundings in Uyui district, thence facilitating sustainable development in Uyui district in Tabora region. The local people are aware that action must be taken to put out a fire that poses a threat to the community, its belongings, and people's lives. Traditionally, people only come together to fight a fire when it is threatening both life and property. When there is no danger to people or property, a forest fire is allowed to burn until it runs out of fuel or is put out by the elements or by natural firebreaks like rivers and rock outcrops. After someone detects a fire and yells for assistance, others assemble (FAO, 2013).

**CONCLUSIONS AND RECOMMENDATIONS**

The role played by indigenous education in conserving the environment by the Nyamwezi community in Tabora region particularly in Uyui district. 90% of the interviewed respondents testified that there was the existence of indigenous education which is embedded with the conservation of the natural environment among the Nyamwezi community in Tabora region. The relational viewpoint can be added to environmental management. According to Berkes (2018), when it comes to nature, indigenous peoples frequently lack words like ‘management’. The terms ‘reciprocity’, ‘respect’, and ‘stewardship’ might be more appropriate in their place. According to Enqvist *et al.* (2018), these three instances highlight the relational aspect of engaging with nature and might serve as an inspiration for relational approaches in environmental management and protection. Protection of totemic animals and trees, and protection of sacred areas for rituals was among the crucial activity in the Nyamwezi community. Local people in Uyui are prohibited from conducting any activity in reserved areas for traditional rituals, thence the mentioned indigenous knowledge has played an essential indirect role in preserving the environment in Tabora.
The study concludes that the Indigenous education among the Nyamwezi community in Uyui district has played a vital role in conserving the environment in Tabora region, though some of the indigenous enlightenment pertaining to the conservation of natural resources such as natural precious trees has been negated to be incorporated by environmental stakeholders hence led to the marginalization of this knowledge and the precious natural resources. The indigenous knowledge in Tabora region is associated with religion, tradition and norms and this has an impact on long-term and short-term ecological preservation in the Uyui district. Nyamwezi native culture which is part of indigenous education had a tremendous impact on, sustainable ecological conservation in Tabora region in Tanzania.

Based on the findings from this study it is recommended that; the stakeholders of forest conservation should incorporate indigenous education which is concerned with the illumination of planting precious and scarce and diminishing tree resources as “mininga” and ‘mikora’ which are very useful for timber production. The study recommended that there is a need for local people and local government to uphold indigenous education which is directly connected with the conservation of the environment, since this will lead to sustainable development in Tabora and Tanzania at large. The study also recommended that there is a need for the government of Tanzania to incorporate indigenous knowledge relating to environmental conservation initiatives into the recently developed education curriculum for the sake of sustainable development in Tanzania.

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Global Trends on Adoption of Open Education Resources in Higher Education Institutions: A Bibliometric Analysis

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Abstract
The study examined the trends in the adoption and implementation of Open Education Resources (OER) in higher education institutions (HEIs) by conducting a bibliometric analysis of 911 publications between 2004 and 2022 from the Dimensions database. The VOSviewer1.6.19 software was used to establish visualization networks on the most influential authors, countries and universities. Further analysis was made to establish publications with higher citations, co-authorship collaborations and the co-occurrence of keywords. The results indicate a steady growth of research articles on OER due to the outbreak of COVID-19. The developed countries had a higher rate of research publications and stronger collaboration patterns in OER than the African countries. The analysis of citation score indicates that the “International Journal of Educational Technology in Higher Education” and “Journal of Interactive Media in Education” were the most popular journals on the topic. The results indicate that the United States of America, the United Kingdom and Spain had the highest links in terms of co-authorship collaboration. In contrast, African countries such as Uganda, Cameroon and Tunisia had very minimal links in terms of co-authorship on the topic. The analysis of keywords occurrence revealed several opportunities for adopting and implementing OER in HEIs which include easy accessibility of digital content and inquiry-based learning. Most of the identified limitations of the implementation of OER in HEIs in sub-Saharan African countries were the high costs of commercial e-textbooks and inadequate funding. Limited knowledge of the institutionalization of OER, institutional low capacity to adopt OER and lack of policies as well as awareness were identified as other factors constraining the effective implementation of OER. This bibliometric analysis provides insights on limitations for effective implementation and institutionalization of OER in HEIs in African countries and paves the way for future research direction on the topic.

Keywords: Digital inclusion, digital divide, digital inequality, e-resources, distance learning, digitalization, remote learning
INTRODUCTION
The interest in open education resources (OER) in many education institutions is growing very fast due to the increased use of digital content for learning and digitalization. The unforeseen increase and adoption of the use of OER in many educational institutions was witnessed during the outbreak of the COVID-19 pandemic. The COVID-19 pandemic pushed many educational institutions around the globe to abruptly shift their instructions digital and allowed learning to become more flexible and affordable for those who face medical, financial, and daily life challenges (Lee & Lee, 2021). Many educational institutions, particularly higher learning institutions (HLIs), paid more attention to OER adoption during the shift to online learning due to lockdown regulations imposed during the COVID-19 pandemic period (Menzli et al., 2022). Although there was a rapid shift to OER during the COVID-19 pandemic, many institutions faced many challenges including a lack of OER policies, lack of awareness and lack of proper monitoring and evaluation practices on the usefulness of OER (Marín et al., 2022; Mičunović et al., 2023). Some instructors in HLIs did not even know about OERs before the pandemic; this contributed to resistance of the adoption to support online distance learning (Sunar et al., 2022). A considerable number of studies indicate that instructors maintained a low level of value beliefs towards using OER due to limited knowledge, motivation and lack of trust on accuracy and comprehensiveness (Cheung et al., 2023; Clinton, 2019; Tang & Bao, 2022).

The existing evidence indicates that the adoption of OERs and open educational practices within higher education policy frameworks is still in its infancy as there is limited institutional leadership support, lack of digital culture and infrastructure (Murphy, 2013; Tlili et al., 2022). The way OER is perceived in many HLIs can give an impression that the implementation is inadequate due to limited understanding. Further evidence indicates that the implementation of OER is very minimal due to the fact that users, particularly students, face difficulties in finding the proper OER materials, and there are quality control issues with resources (Al abri & Dabbagh, 2018; Mishra, 2017). Other studies indicate that there are ethical violations among users due to limited knowledge, skills and lack of policy guidelines about the adoption of OER (Mncube & Mthethwa, 2022). In the context of this study, OER is considered as learning, teaching, and research materials in any format and medium that reside in the public domain or are under copyright license that permit no-
cost access and which can be reused, adapted and redistributed in HLIs repositories (Tanzania Commission for Universities, 2022; UNESCO, 2020b). Online learning in HLIs can be supported by the availability of OER in the institutional repositories. However, evidence indicate that many HLIs, particularly in developing countries, have no strong repositories due to limited time of preparation, lack of willingness to adapt and lack of adequate knowledge for preparations (Mtebe & Raisamo, 2014; UNESCO, 2020b).

Although some developing countries have started developing the guidelines on the adoption of the OER, still, one could notice several limitations which include a lack of compliance to legal and regulatory obligations from adoption. Others are the lack of institutional repositories, lack of learning management system (LMS) and lack of mechanisms to ensure the quality of adopted OER. In the Tanzanian context, for example, the guideline of online and blended delivery in HLIs emphasizes that universities should have in place an OER policy that allows the internal reuse of developed learning resources and adopt OER from other repositories for easy access of digital resources among students (Tanzania Commission for Universities, 2022). While the guideline is clear about accessibility of OERs, still, many universities in Tanzania face several challenges such as a lack of reliable internet, lack of adequate computer labs and lack of systems that can support the accessibility (Mtebe et al., 2021; Mwinyimbegu, 2019; Ndibalema, 2022). Further evidence indicates that universities in developing countries face several other challenges that limit easy accessibility of OER. Such challenges include students’ lack of computer skills, limited pedagogical skills among instructors to prepare the resources and limited access to digital resources (Mengistie, 2021; Tanyanyiwa & Madobi, 2021). With these challenges, some students prefer print materials over online resources due to the complex nature of the rural environment which has limited infrastructure and technological development (Mahai, 2022; Mengistie, 2021; Samzugi, 2019). Limited accessibility, affordability and availability of OER is significantly exacerbated by the prevalence of digital divide which has been a critical problem in many HLIs in increasing inequalities in accessing OER (Mathrani et al., 2022; Zhong et al., 2021). It is clear that the prevalence of digital divide creates a paradox when institutional programmes emphasize on development of digital literacy among students while the digital spaces do not fully support such development.
While many global initiatives emphasize on inclusive digital education for enhancing digital literacy skills (European Agency for Special Needs and Inclusive Education, 2022; Q. Tang, 2015; UNESCO, 2020a), still, one could notice limited strategies available to ensure that every student can fully utilize technology to access OER. As a result, many students from HLIs in developing countries graduate with limited digital skills that can help them to cope easily with the world of work. There is no doubt that the utilization of OER should continue but digital transformation in HLIs is crucial. It remains unclear when this transformation will be achieved as the adoption of technological solutions in HLIs is slow. In addition, despite its importance in improving the quality of education, how instructors and students utilize OER in teaching and learning is still under-researched. Again, there is limited evidence regarding the trends on the adoption of OER in HLIs. Thus, the current bibliometric analysis synthesized the existing evidence to establish the global trends on the adoption of OER. More specifically, the analysis considered various opportunities and limitations about the adoption of OER over years. Yet, the adoption of OER in many HLIs is relatively new and evidence regarding its proliferation is scarce. Therefore, the current bibliometric analysis sheds light on how HLIs can benefit on the current evidence so as to unpack existing technological challenges to enhance smooth adoption of OER.

**METHODOLOGY**

The empirical articles included in the analysis were retrieved from the Dimensions scientific database. Dimensions database has been acknowledged as one of the scientific databases that provide greater sense of context of research and allows users to fulfill a significantly wider set of use cases (Hook et al., 2018). Data from the Dimensions database were exported on Feb 24, 2023. The search formula was based on the following criteria: “Adoption” AND “Open Education Resources” AND “Higher Learning Institutions” OR “Higher Education” OR “Universities” OR “Colleges.” The search for publications was limited to the period from 2008 to 2022. Further consideration was on the open access empirical articles based on the fields of research in education systems OR curriculum and pedagogy OR education OR education policy OR specialist studies in education OR information and computing sciences OR library and information studies.
Inclusion and exclusion criteria
The inclusion criteria were (a) empirical peer-reviewed on Open Education Resources (OER); (b) study population of students OR instructors in Higher Learning Institutions; (c) publication from 2008 to 2022; and (d) language (empirical articles published in English). The exclusion criteria were articles that (a) were not focusing on OER about students or instructors (b) did not use English as a publication language (c) review/literature review articles. After applying the filters and inclusion and exclusion criteria, the 12,793 documents the search had produced were reduced to 911. The exclusion procedures are summarized in figure 1 next.

Figure 1: Flow diagram for the systematic review following the PRISMA statement

DATA ANALYSIS
The VOSviewer 1.6.19 software was used to carry out visual analysis of the research articles. The networks visualization analysis of the co-
authorship and citation network was established. Further analysis included most prominent journals, authors, countries and organizations about the topic. The analysis about the co-occurrence of keywords was also conducted to identify terms associated with opportunities and challenges about the adoption of OER.

**FINDINGS**
The analysis was made on the trends on the number of publications per year from 2008 to 2022 on the growth of OER in HLIs. The trends on the growth is reflected in Figure 2

![Figure 2: Annual number of publications about OER](image)

Data in figure 2 indicates that there has been an increase in publications about OER in HLIs over the years. The rate of increase between the years 2019, 2021 and 2022 is higher than in other years. This can be contributed by a higher rate of transition to online distance learning among many HLIs due to outbreak of COVID-19 pandemic.

**Co-authorship links**
The analysis involved a minimum of 2 articles and 3 citations of an author where out of 1879 authors, 162 met the thresholds. For each of the 162 authors, the total strength of the co-authorship links with other authors was calculated and authors with the highest links were selected. Table 1 highlights top 10 authors with the highest total links.
Table 1: Most prominent authors about the topic

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name of author</th>
<th>Number of publications</th>
<th>Citations</th>
<th>Total link strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Huang Ronghuai</td>
<td>7</td>
<td>239</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>Tlili Ahmed</td>
<td>7</td>
<td>239</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Burgos Daniel</td>
<td>9</td>
<td>310</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Nascimbeni Fabio</td>
<td>8</td>
<td>264</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>Weller Martin</td>
<td>10</td>
<td>144</td>
<td>21</td>
</tr>
<tr>
<td>6</td>
<td>Pitt Rebecca</td>
<td>7</td>
<td>76</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Hilton John</td>
<td>12</td>
<td>694</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Admiraal Wilfried</td>
<td>5</td>
<td>58</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>Baas Marjon</td>
<td>4</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>Chang Ting-wen</td>
<td>3</td>
<td>203</td>
<td>16</td>
</tr>
</tbody>
</table>

Further analysis was made to establish the network visualization about the co-authorship links. The network visualization is presented in figure 3.

![Network visualization of co-authorship links](image)

**Figure 3:** Network visualization of co-authorship links

The results indicate that Huang Ronghuai, Tlili Ahmed, Burgos Daniel, Nascimbeni Fabio and Hilton John had the highest co-authorship strong links in the field of OER. The results indicate limited co-authorship collaborations of authors from sub-Saharan countries.

**Co-Authorship analysis by organizations**

The analysis was made based on the minimum of 2 articles and 3 citations per organization. Of the 645 organizations, 164 met the thresholds. Institutions with strong links in terms of co-authorship are presented in figure 4.
Figure 4: Network visualization of co-authorship by organisation

The results in figure 4 indicate that the Open University, national university of distance education and Brigham young university had strong association in terms of co-authorship. The University of Cape Town was the only university with some co-authorship collaboration from sub-Saharan Africa. The prevalence of few universities from sub-Saharan Africa could be an indication of low adoption of OER.

Co-authorship analysis by countries
The analysis was based on the minimum of 2 articles of a country and 3 citations. Of the 96 countries, 58 met the threshold and selection considered countries with the greatest total links as indicated in Figure 5.

Figure 5: Network visualization of co-authorship by countries
The results indicate that the United States of America, United Kingdom and Spain had the highest links in terms of co-collaboration. African countries such as Uganda, Cameroon and Tunisia appeared to have very minimal links in terms of co-authorship on the topic.

**Most influential journals about the topic**
The analysis was based on the minimum number of 5 citations of which 55 journals met the threshold out of 296 journals. Table 2 presents the top 10 journals with highest citations on the topic.

**Table 2: Distribution of articles by journal with total highest links**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Journal</th>
<th>Articles</th>
<th>Citations</th>
<th>Quartile</th>
<th>H-Index</th>
<th>SJR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>International journal of educational technology in higher education</td>
<td>23</td>
<td>802</td>
<td>Q1</td>
<td>49</td>
<td>2.05</td>
</tr>
<tr>
<td>2</td>
<td>Journal of interactive media in education</td>
<td>46</td>
<td>504</td>
<td>Q2</td>
<td>12</td>
<td>0.64</td>
</tr>
<tr>
<td>3</td>
<td>Distance education</td>
<td>16</td>
<td>435</td>
<td>Q1</td>
<td>63</td>
<td>1.88</td>
</tr>
<tr>
<td>4</td>
<td>Sustainability</td>
<td>14</td>
<td>421</td>
<td>Q1</td>
<td>136</td>
<td>0.66</td>
</tr>
<tr>
<td>5</td>
<td>Educational technology research and development</td>
<td>14</td>
<td>380</td>
<td>Q1</td>
<td>101</td>
<td>1.52</td>
</tr>
<tr>
<td>6</td>
<td>Computers and education</td>
<td>8</td>
<td>292</td>
<td>Q1</td>
<td>215</td>
<td>3.68</td>
</tr>
<tr>
<td>7</td>
<td>Smart learning environments</td>
<td>11</td>
<td>242</td>
<td>Q1</td>
<td>24</td>
<td>0.97</td>
</tr>
<tr>
<td>8</td>
<td>Journal of computing in higher education</td>
<td>7</td>
<td>221</td>
<td>Q1</td>
<td>47</td>
<td>1.34</td>
</tr>
<tr>
<td>9</td>
<td>Education and information technologies</td>
<td>23</td>
<td>199</td>
<td>Q1</td>
<td>61</td>
<td>1.25</td>
</tr>
<tr>
<td>10</td>
<td>International journal of emerging technologies in learning</td>
<td>19</td>
<td>88</td>
<td>Q2</td>
<td>39</td>
<td>0.54</td>
</tr>
</tbody>
</table>

The results in Table 2 indicate that “International journal of educational technology in higher education”, “Journal of interactive media in education”, “Distance education” and “Sustainability” are the most leading journals with the highest citations. Again, all journals were under quartile one and two.

**Keywords analysis**
The analysis of keywords was based on the minimum 5 key terms occurrence in all articles. Out of 14688 terms, 907 met the threshold. The analysis was also based on the default choice of 60% of most relevant terms whereby 544 words were selected. The results are presented in figure 6.
The results indicate several opportunities of adopting and implementing OER in HEIs. These opportunities include easy accessibility of digital content, improved digital competence, increased digital resources and inquiry-based learning. The results also indicate some limitations which include limited access of OER among students with disabilities, high costs of commercial e-textbooks and inadequate funding. Limited knowledge in institutionalization of OER, originality value and privacy policies were identified as other factors constraining effective implementation of OER. It is also remarkable that the term like ‘COVID’ stood out in the patterns which could suggest that it impacted the growth of OER in most HLIs.

DISCUSSION
The findings indicated that there were limited collaborations in terms of co-authorship, particularly authors and universities from sub-Saharan countries. It was also figured out that the developed countries such as the United States of America and the United Kingdom were the most active countries with high production and co-authorship links. This is an
indication that there is limited international cooperation which may contribute to inadequate understanding of several OER adoption practices in other contexts. Similar findings were revealed by (Tlili et al., 2021) who found that limited international cooperation in terms of co-authorship leads to limited understanding of educational practices across different cultural contexts. It is reported that OER is only limited to specific African countries, calling for more research and collaboration across countries globally so as to enhance more educational equity opportunities in educational institutions (Tlili et al., 2022). Lack of strong collaboration in publications may have some implications on the lack of opportunities to attract external funds and expertise that aim at solving global challenges. Despite the African Union emphasis on digital transformation in universities through investments and strengthening the international collaborations in terms of research and innovations (African Union, 2015), the universities give it low attention. Most HLIs in sub-Saharan Africa are experiencing digital inequalities which in turn leads to limited adoption of OER and other digital solutions in learning (Hartmann & Shajek, 2023). It makes sense to note that university potency and ranking is measured through various indicators such as international collaborations, innovations, research, visibility and academic partnerships. If universities in sub-Saharan Africa need to attain higher ranking, strengthening technological systems is not an option.

While the digital transformation strategy in Africa emphasizes on promoting policies and strategies that support cooperation in the use of OERs to promote access to educational content (African Union, 2019), the current study indicates that some universities have not adopted and institutionalized the OER policies. Other researchers note that the existing inequalities in the global and local educational networks discourage the production and dissemination of OER in most developing nations (Mishra et al., 2022). The adoption and implementation of OER in some institutions is constrained with several factors such as lack of knowledge, lack of skills, and lack of policy and guidelines about the adoption and development of OER (Mncube & Mthethwa, 2022; Mwinyimbegu, 2019). Most HLIs in sub-Saharan Africa cannot afford the costs of commercial e-textbooks due to inadequate funding. Universities in Tanzania, for example, face inadequate funding due to decreasing budget and disbursed funds which compromises the quality of services, including limited adoption of digital learning solutions such as OER which require funds (Mgaiwa, 2018). The adoption of digital learning solutions and digital
transformation in HLIs is greatly affected by a lack of funding and budgetary constraints; most developing countries have been more vulnerable (Gkrimpizi et al., 2023).

The findings indicate variations between developed and developing countries, whereby developed countries such as the USA seem to be ahead. This demonstrates the value of having strong collaborations and partnerships so that varying strategies can be integrated to uplift the implementation of OER. Gaining an understanding through partnerships could be essential as actors in HLIs could learn from each other and link the learning benefits of OERs to students. However, it is argued here that these cannot be achieved if there are no clear policies guiding international collaborations and willingness to share professional culture. This study prompts further dialogue and encourages more educators to consider creating more international links which could facilitate effective adoption of more technological solutions and new developments such as OER in their teaching.

Although the current study indicates the growth on the adoption of OER in HLIs during COVID 19, still, one could notice several constraints that limited its implementation. Several empirical studies report lack of awareness, lack of technical skills to develop OER, unfamiliarity of open source software that can support the adoption of OER, and some OER are published online without knowing the reliability of the authors (Huang et al., 2020; Mičunović et al., 2023). Other challenge affecting the developing countries is unequal access to internet by educators and learners. This is due to problems related to network coverage, especially for learners located in rural areas, or sometimes a lack of equipment and lack of digital skills among educators to implement OER (Ouahib et al., 2023). It is likely that educators and learners who lack exposure and digital culture may feel less confident in adoption of OER. The preparation of OERs to some instructors seems to be an overwhelming task when there is no technical support to help them.

Some universities in developing countries in particular did not migrate to online distance learning during COVID-19 pandemic due to lack of pedagogical competencies among instructors, unavailability of LMS to support the sharing of OER and unreliable internet accessibility (Makafane & Chere-Masupha, 2021; Mtebe et al., 2021; Ndibalema, 2022). Better adoption of OER in HLIs depends on a number of factors
including adequate investment in digital spaces for learning where there should be systems to support easy accessibility. The adoption of OER demands more intellectual work on the instructors’ side in comparison with the adoption of a new commercial textbook (Wang & Wang, 2017). Thus, students and instructors may be motivated to OERs if they are easily accessible and decreased costs to access them (Allen, 2023). However, some scholars have cautioned that instructors should not be satisfied only by consuming the materials available on the various open digital platforms alone, but they should also participate and contribute to the creation of content and its distribution to others (Menzli et al., 2022). This is an indication that the sustainability of adoption of OER depends on instructors’ ability to create and develop relevant materials to students’ learning.

It is urged that HLIs should promote the integration of OER into curriculum, support capacity building, create awareness, ensure development, storage and accessibility (UNESCO, 2019). This has not been achieved in many HLIs particularly in developing countries where students have shortage of digital devices to access electronic materials (Mengistie, 2021; Mushimiyimana et al., 2022; Ouma, 2019). As a result, students prefer to rely on printed materials while ignoring the electronic ones (Samzugi, 2019; Tanyanyiwa & Madobi, 2021). Nonetheless, we cannot ignore the suggestion by Mncube and Mthethwa (2022) who emphasize on considerations of peer review process when publishing OER to ensure their quality and relevance. There is no doubt that if OER are well prepared, it is possible that many students and instructors could benefit from them. If properly integrated into the curriculum, there is a high chance to increase accessibility and improve instructional quality (Griffiths et al., 2022). The findings of the current study also revealed other several opportunities which include the possibilities of improving inquiry-based learning among students, digitalization, improved digital competence, and increased digital resources. In addition to these benefits, other scholars report several other opportunities which include expanded access to knowledge, supporting lifelong learning, pedagogical benefits, time saving and enhancing students’ learning outcomes (Adil et al., 2022; Islim & Cagiltay, 2016). Furthermore, the implementation of OER is perceived to increase the accessibility of digital resources, cost-effectiveness, flexibility, and autonomy in learning (Lee & Lee, 2021; Nguyen & Tam, 2023). It makes sense to note that although there are several benefits regarding the adoption of OER, there is limited evidence
Global Trends on Adoption of Open Education Resources in Higher Education Institutions: A Bibliometric Analysis
Placidius Ndibalema

regarding its potentiality. The implementation of OER in HLIs has not been fully explored, which calls for further research.

CONCLUSION AND RECOMMENDATIONS
The current study indicates some learning opportunities as a result of adoption and implementation of OER. It is perhaps appropriate to see both instructors and students reflecting on their professional growth through OER. Through such opportunities provided by OER, students are more likely to develop skills needed for their future careers. The analysis found that the adoption of OER provides an avenue for self-directed learning and inquiry-based learning which are essential in strengthening individual competence. Yet, HLIs particularly in developing countries give less priority to OER as there are no clear policies in place and limited investments in technological systems that can support the implementations. HLIs in developing countries lack strong collaborations with other international institutions that can support the adoption. It is noteworthy that many students in HLIs have better technological skills but they lack institutional support to build strong awareness on the acquisition of OER. This can be intimidating to their digital well-being and their ability to develop 21st century skills.

Engaging students in acquisition of OER has the potential to help them develop more digital literacy skills to use in daily life. However, this has been the missed opportunity due to inadequate emphasis in adoption of technology in HLIs. Students need to be supported to appreciate the value of OER. If students have developed awareness to take advantage of opportunities provided by OER, learning inequalities are likely to be minimized. Strengthening institutional collaboration, institutional policies, technology infrastructure, internet accessibility, instructors and students’ capacity would fuel the adoption of OER in HLIs. This bibliometric analysis provides some insights to HLIs about opportunities and stumbling blocks which could be used as a reference point for universities that need to adopt and implement OER. This study has clearly indicated that collaboration between institutions is essential in enhancing effective adoption and implementation of OER.

The results of the current bibliometric analysis suggest that there are limited studies on OER in HLIs in developing countries due to lack of awareness and policies. However, the current review did not critically highlight possible psychological impact among students who fully rely on
OER in their learning. Future research may capitalize on this and address some possible psychological impact of engaging students in OER. Again, the current review employed a bibliometric analysis of research articles from the Dimensions database only while focusing on HLIs. Future research may consider other levels of education while reflecting on other sources than empirical articles only.

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Placidius Ndibalema


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Zhong, J., Zheng, Y., Huang, X., Mo, D., Gong, J., Li, M., & Huang, J.
Assessment of Reasonable Accommodations and Adaptations for Learners with Autism Spectrum Disorders in Inclusive Elementary Schools of Tanzania

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Abstract
This study investigated the reasonable accommodations and adaptations for learners with Autism Spectrum Disorders in inclusive education settings. The study employed multiple case study design, with unstructured interviews, non-participant observation and focus group discussions as data gathering tools. A total of 24 respondents participated in the study. Data were thematically analysed method with the aid of Nvivo12 computer software. The study revealed that learners with autism spectrum disorders do not have the right support structures and appropriate reasonable accommodations and adaptations. The findings also earmarked the use of different materials and methods for learners with Autism spectrum disorders. Insufficient sensory stimulation and the shortage of trained teachers compromised effective learning for autism disorder individuals. The study concludes that the practice of inclusive education for learners with autism spectrum disorders in Tanzanian elementary schools has a long way to go. The need to have clear guidelines and directives on the appropriate implementation of the National Strategy for Inclusive Education (NSIE), particularly for learners with ASD in elementary schools, is highly recommended.

Keywords: Autism Spectrum Disorders (ASD), Inclusive Education, Reasonable accommodations, Adaptations, Universal Design of Learning (UDL).

INTRODUCTION
According to the medical descriptions, Autism Spectrum Disorder is a Developmental disability (Spencer & Simpson, 2009) or a “neurodevelopmental disorder” which affects the central nervous system and how an individual and stores information in the brain, Its severity
Assessment of Reasonable Accommodations and Adaptations for Learners with Autism Spectrum Disorders in Inclusive Elementary Schools of Tanzania

Miriam Loivotoki Laiser, Mohamed Salum Msoroka and Theresia Shavega

ranges from mild to severe (American Psychiatric Association, 2012). Inclusion of learners with autism spectrum disorders in elementary schools is getting attention. Learners with autism think differently from the neurotypical and require specific intervention. This affects their communication, their social interaction, and their behaviours (Briskman et al., 2020).

Scholars argue that autism is not always visible (D’Elia et al., 2014). It can lead to those in the spectrum excluded from access to the curriculum (Strogilos et al., 2017). In other words, learners with autism easily get labeled as children with behavioral problems (Manji & Hogan, 2013). This prompts these learners to drop out of school or never be enrolled in schools (Manji, 2018). Statistics show that around 400,000 school aged children in Tanzania live with disability and only about 60,404 are enrolled in schools (Action Aid et al., 2020). This suggests that only 15% of these children are in schools. To be inclusive, teachers will need to use effective teaching strategies that meet different needs of neurodivergent and neurotypical.

Accommodation and adaptation help to properly address the needs of these learners (Kofidou et al., 2023; Mantzikos et al., 2017; Mantzikos & Lappa, 2023). Inclusion of learners with autism is not attempting to change them, but adapt the curriculum, the classroom, the buildings, and teaching styles to accommodate them (J. Kurth & Mastergeorge, 2010). The proponents of inclusion argue that schools should change the curriculum, building designs, extra-curricular activities and adapt measure to accommodate learners with autism. This, however, depends on the availability of resources and expertise of teachers (Mtemi Philip, 2022). The Tanzania National Strategy for Inclusive Education (The United Republic of Tanzania, 2017) has defined inclusive education as an approach which transforms the education system, including its structure, policies, practices and human resources, to accommodate all learners in mainstream education by addressing and responding to learners’ diverse needs. It involves adaptation and modification of curriculum content, teaching and learning materials, pedagogy and environment to ensure access and participation of all learners. This study sought address one research question: What reasonable accommodations and modifications are in place for learners with autism spectrum disorders in the inclusive schools?
METHODOLOGY
This study employed interpretivist research paradigm. This paradigm believes that human behaviour is multi-layered (subjective) and it cannot be determined by pre-defined probabilistic models (Creswell, 2007; Mackenzie & Knipe, 1983; Ritchie & Lewis, 2003). The appropriate schooling for learners with autism is the subject that requires an investigation to be done in the naturalistic setting (real-life setting). Hence the study employed pure qualitative research approach because it allows assessment of interactions and experiences in the natural settings (Creswell, 2007). The parallel multiple-case study design was employed in order to capture the holistic overview about the phenomena under investigation. Data were gathered through non-participant observation, unstructured interviews, focus group discussions, and documentary reviews.

The participants were purposively selected from seven inclusive elementary schools in five regions of Tanzania (i.e., Dar es salaam, Tanga, Mbeya, Dodoma and Iringa). Snow-ball sampling was used to obtain respondents with specific characteristics of interest to be included in the sample. Participants for interviews were special/inclusive educational teachers, parents/caregivers, and children with autism, as well as those who did not have autism. The total of 24 participants were interviewed including 14 teachers, five parents and five students.

Data were thematically analysed with the aid of Nvivo 12 computer software. Themes were developed deductively from the established characteristics areas of Autism Spectrum Disorders that interfere with the effective schooling. The sub-themes have been obtained inductively from the participants’ interview scripts.

FINDINGS AND DISCUSSION
Inclusion gap towards accommodating children with autism
It was observed that the three public own schools e not reflect the standards and philosophy of inclusion, especially for learners with Neurodevelopmental Diversities (i.e., autism, intellectual impairments, communication disorders, and learning disabilities). These learners spent most of their schooling hours in a self-contained classroom or special-unit class. The inclusion criteria depended on the severance of the disability.
However, learners with visual, physical and hearing impairments were fully enrolled in the inclusive classrooms (Strogilos et al, 2017).

The study found that the four privately owned schools had evidence-based reasonable accommodation and modification required for the smooth inclusion of learners with autism. Only one out of three public owned schools had these. The findings are presented in the six themes developed according to the 3 characteristic areas that learners with autism spectrum disorders do struggle and hinder their full participation in the curriculum. The three areas are (i) language and communication (ii) social interactions and (iii) repetitive and restrictive behaviours. These are illustrated below.

**Language and Communication**

The respondents mentioned that the use of Pictures Exchange Communication System (PECS) or visual and real-object-images helped to communicate with autism learners. This method was evident across the four privately owned schools. In relation to this, the participants said:

*So if you want to give them instructions you should be brief, don’t narrate stories for too long because they get bored easily with auditory information, and they may end up ignoring or leaving you and stop listening* (Teacher, JB)

*You have to be brief and precise when you give them instructions, or you may accompany your instructions with visuals because some of them are completely non-verbal and they do not have alternative means of communication* (Teacher ZX)

However, PECS and visuals were not regularly used in some schools to communicate with learners who are non-verbal and verbal. Public schools regarded PECS and visuals as important in helping non-verbal learners to communicate with others. One of the students commented:

*Yes, they should improve the classrooms and put images of real objects inside the classrooms so that the non-verbal learners can use the pictures to communicate* (Student RY)

The use of pictures exchange communication system or visuals has been mentioned by many literatures to be the most effective methods to communicate and train individuals with autism spectrum disorders (Atun-Einy et al., 2013; Kurth et al., 2015; Lindsay et al., 2013, 2014; Vander
Wiele, 2011; Waddington & Reed, 2017). Other ways that schools communicated with autism learners was non-verbal cues, the use of real objects and the use of sign language. However, some participants were concerned that the use of sign language for learners with autism was challenging because memorization of the finger alphabets require a high level of coordination, executive functioning, and memory something that majority of these learners are not good at. Whether sign language can be used as an alternative language or not remains questionable for further research and investigations (D’Elia et al., 2014)

**Social Interactions**

Deficit in social interaction and difficult to abide by the social rules are among the characteristics of autism spectrum disorders condition. The respondents mentioned that people around the school need to show unconditional love and acceptance for these individuals with autism as the mechanism to help them thrive socially and initiate interactions with others. One participant stated:

> What we do is; from the beginning of the day as a teacher I am supposed to be calm so that the child can invite me in their world. Because they cannot communicate with words, these children have their own worlds. I have to be intentional to be friend to them so that I can know what they like and what they do not (Teacher, JW)

Another teacher illustrated:

> What I have noticed is that children with autism need a lot of love for them to show appropriate behavior and if these children get harsh treatment they do retaliate and become very aggressive (Teacher, OG)

Respondents also indicated that intentional efforts to create autism awareness around the school are a viable means to help them in the area of social interactions. This strategy was reported to be more effective because it helps the entire school to manage autism learners’ social expectations. One of the participants said this:

> We do start by mobilizing other “typically developing children” and encourage them to befriend and welcome their fellows who have autism. Starting with the typically developing children is easy because they can understand you easy and they can easily initiate interactions. (Teacher, MN).
Another participant also commented:

*The most important thing is community awareness. Every person should be able to know children with autism and their symptoms. They should understand that children with autism have deficits in social interaction and communication, and that some of them are non-verbal. Sometimes these children do not have social boundaries* (Teacher, CJ).

In addition to the unconditional love and acceptance, the respondents recommended the use of the Child to Child Approach in helping learners with autism to enhance their social interactions and developing basic functioning skills. The use of other “typically developing children” has been documented literature and it is termed “Modeling” or “Role Play” (Humphrey & Symes, 2010; John-Steiner & Holdbrook, 1996; Mwakalinga, 2012). This approach is helpful because learners with autism are known to be good at imitating what other children do. This means that when these children watch a competent peer performs a certain task such as greeting elders or seeking help, they learn that important life skills. One of the participants remarked:

*Another method that we use is the ‘Child to Child approach.’ As a I have a lot of things in my plate, so I can order another child within my class to support a child with disability by just saying; “Anna, can you please hold Mary’s hand and direct her to the toilet?* (Teacher, CJ)

In their interviews, students believed that this approach make learners with autism feel good and develop a sense of dignity and fulfillment to help their colleagues. One participant had this to say:

*I feel good because sometime students with autism can have issues that they do not understand and that can be an opportunity for me to help them understand. I do not stigmatize them* (Student, KM)

This findings resonates with the literature that affirms the differentiated practices as synonymous to inclusion (Strogiolos et al., 2017). This practice regards inclusion as a way of increasing participation for all children and adults and a means to support schools to become more responsive to the diversity of children’s backgrounds, interests, experience, knowledge, and skills.

**Repetitive behaviours**

The presence of restrictive and repetitive stereotyped behavior is another significant symptom of autism spectrum disorder that hinders their
effective participation in school activities. This raises a major concern for teachers and other staff working with these learners. Some repetitive behaviours are in form of sounds and flipping of hands (Anglim et al., 2018; Humphrey & Symes, 2013; Mwakalinga, 2012).

One participant went on to illustrate:

*Also, these children with autism are not able to explain when they are sick. So, we do study their behavior daily to notice if there is any change in behavior and support them accordingly. When we see them to be more reserved than normal or too quiet than their usual self, we do assess to see if everything is fine* (Teacher, OG)

Schools use different strategies to manage and modify behaviours (Anglim et al., 2018; Mwakalinga, 2012; Myers et al., 2007). Behaviour Replacement Methods is commonly used where by a child with ASD is provided with alternative activity. The alternative behaviour is implemented after a period of data collection on the behavior occurrences in order to determine their frequency, the time that it normally occurs, the antecedent that happen prior to the behaviour as well as and consequence of the behaviour.

The participants were of the opinion that the implementation of the strict school structures and routines also help to deal with such behaviours. Literature points out that learners who are in the spectrum thrive in routines and prefer to have things done in the same way every day (Cermak et al., 2010; Lindsay et al., 2013; Vander Wiele, 2011). Any minor change in the routine may cause them to act out in a way that may be interpreted as a behaviour issue. One of the participants offered this example:

*When it is time for food they can just stand and walk out of the classroom even if the teacher is still teaching.... So, whenever we anticipate changes in the routines, timetables, and food we take time to explain it to them before they experience that change* (Teacher, UV)

Some learners with autism were reported to have self-injurious behaviours and sometimes act out in a manner that may cause harm to other students. The participants declared that they used Calm Down Rooms and the Self-Enclosed settings as a means to isolate them for a while so that they can get time to calm down. This was done before these
children went back to their respective inclusive classrooms. This findings resonates with the scholarly writings on sensory integration as one of the therapies used in autism interventions (Bailey & Baker, 2020; Cermak et al., 2010). Setting high expectations and close monitoring help learners with autism manage their repetitive behaviors.

Multi-sensory teaching methods and materials
The participants identified digital learning and audio-visual learning materials such as computer, videos, audio books and talking tablets as the most effective for learners with autism spectrum disorders. The importance of these devices in the teaching and learning was affirmed by one teacher. She remarked, “The use of videos and audio visuals in some of their subjects help to increase their understanding of the subject matter” (Teacher, QX). One of the students supported this: “We can work on the computer; we can read and write and we can play video games.” (Student FR).

Literature (Edward, 2015; Mapunda et al., 2017) argues that learners with autism spectrum disorders struggle to grasp the abstract knowledge, and find it hard to understand concepts which are not visible. To help them understand the subject taught in school and to combat these challenges the use of real objects is crucial.

Individualized Attention and Support
The findings indicate that, one of the important reasonable accommodations that is highly needed for learners with autism spectrum disorders is the individualized attention and support. This is due to the complexity of the autism spectrum disorder condition and the diversity within the population of learners who are within the condition. The participants suggested one and one support approach so as to offer the tailor-made solution for the developmental gaps, enhance the individual strengths, as well as use the learning strategy that works according to an individual child as one participant said: “We ensure that these children are provided with individualized attention and support in order to address the learning needs and developmental gaps of that particular child” (Teacher, AY). The IEP is the tool that is used to document the areas of strengths so as to prepare learning activities that are needed for the child to progress in that particular area (Emam & Farrell, 2009; Groom & Rose, 2005; Kurth & Mastergeorge, 2010). The IEP covers all the developmental
areas such as gross and fine motor skills, cognitive, speech and language, as well as daily life skills and academics. One teacher acknowledged:

*There are no changes in the curriculum content, but the only modification is the use of Individualized Education Plan...And the main tool that helps us in teaching learners with autism is their IEPs. This is because in our classrooms we have children who have diverse learning abilities.* (Teacher, ZQ)

Setting high performance targets for learners with autism in all the developmental areas is correlate to attainment of the expected educational and behaviour outcomes (Nigmatullina et al., 2021). Regular home visits to assess the situation of the child, clarify some issues to parents at their homes, and reinforce some of the behaviour interventions in place as a critical component.

**Parental Training and Involvement**

Findings of this study have indicated that parental involvement is the critical component in the attainment of the expected progress in academics, behaviour and basic life skills for learners with autism spectrum disorders. Respondents have also mentioned that early acceptance of the child’s diagnosis contributes to the early intervention and early improvement of the ASD symptoms. Special education teachers mentioned that some therapies and learning activities need to be done by parents at home so as to ensure consistency and continuity of the intervention. This findings align with the literature (D’Elia et al., 2014; Emam & Farrell, 2009; Lindsay et al., 2013; Roberts & Simpson, 2016) which illustrates the rationale of parents involvement in teaching and learning of these learners.

The participants expressed that parental acceptance of their children’s condition is the most important factor for the effective inclusion of learners with autism. Other participants, however, acknowledged that continuous parental training helps them to accept the condition, and become advocates of their child condition to other family members and neighbours. One participant made this comment:

*Parents who observe to do everything as we have agreed with them do help their children acquire milestones in a very short time, and those who do not take heed; they do make their children take longer in acquiring the expected milestones. I believe that once parents accept and the community is aware and the government takes full responsibility to support, then these children will be able to access their rights without any problem.* (Teacher AJ)
One parent of the child with autism testified:

*Nowhere, I do try to resolve it myself and do my best to advocate about the condition of my child to my neighbours and the people around me so that they can be more understanding in case he does something that they never expected* (Parent ZZK)

Parental involvement in education has been reported to have positive contribution to the schooling of all kinds of learners, not only those with disabilities (Moran, 2018; Roberts & Simpson, 2016). A study by Mantzikos et al. (2017) also indicated a positive experience of parents whose children are attending inclusive classrooms in Greece, through parent-teacher collaborations, as well as continuous feedback and training.

**CONCLUSION AND RECOMMENDATIONS**

This study aimed at investigating the reasonable accommodations and modifications that are implemented by schools in order to effectively include learners with autism spectrum disorders. It became apparent that individuals with autism spectrum disorders have characteristic symptoms that limit their abilities to communicate verbally or non-verbally. They also struggle with social interaction and have uncommon obsession and interest to certain stereotypic behaviours which might hinder their effective participation in educational programs (American Psychiatric Association, 2012; Atun-Einy et al., 2013; Bailey & Baker, 2020; Symes & Humphrey, 2011). Because of this, utilization of the Universal Design of Learning (UDL) by incorporating reasonable accommodations and modifications in the curriculum, environment and processes is inevitable (Majoko, 2017; Nigmatullina et al., 2021; Opini & Onditi, 2016; Segall & Campbell, 2012; Sifuna, 2007). Findings of this study have revealed a significant gap in practice in public inclusive schools. A notable resources and handling of these learners has been observed in the privately-owned institutions. Intentional efforts to bridge the gap between policy and implementation is needed.

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Predictors of Parental Home Involvement in Low-Income Families in Tanzania

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Abstract
Understanding factors influencing parents' involvement in education activities is essential in tailoring strategies to encourage and maximize their participation. This study assessed predictors of parental home involvement in low-income families in four regions of Northern Tanzania. The questionnaires assessed 1176 parents of grade two children from 55 primary schools invited to teacher-parent meetings. The hierarchical multiple regression analyses showed that parents' perception of general school invitation, specific teacher invitation, specific child invitation, parents' knowledge and skills, parents' level of education, and marriage conditions were the strongest predictors of parental home involvement. However, parents' past school experience (valence) did not predict their present involvement at home. This study underscores the pivotal role of teachers and schools in instigating and fostering parental involvement at home. Teachers can create a collaborative learning environment beyond the classroom by implementing activities designed to arouse parents' interest and stimulate their desire to participate actively in their children's learning. The study recommends the interconnectedness of the educational ecosystem, where the efforts of schools and teachers serve as catalysts for meaningful parental involvement at home.

Keywords: Parental Involvement, Home Involvement, School-family partnership, Low-income families, Primary School

INTRODUCTION
Tanzania makes a significant step in increasing access to basic education by implementing the fee-free education policy in seven years of primary education and four years of ordinary secondary education. With all these efforts to increase the enrollment rate, the quality of education and equality in learning opportunities between children are still questionable (Twaweza, 2019; 2017). These uncertainties cause a significant achievement gap between children living in low-income families in
public schools and children living in middle-income families in private schools (UNESCO, 2019; URT, 2020; 2021).

Although many discussions and concerns have been directed toward the quality of classroom instructions, efficiency of teachers and other school factors, little attention has been paid to the role of parents in children's learning. The insignificant improvements in early literacy development raise concern about the limited involvement of parents in their children's education (Kigobe et al., 2018; Kigobe et al., 2021). To address these concerns, it is crucial to understand the factors influencing parental involvement in the education and schooling of primary school children in Tanzania, particularly within low-income families. By identifying these factors, educational stakeholders can develop targeted interventions and strategies to promote parental engagement. This can, subsequently, contribute to reducing the achievement gap between children from low-income families and their more privileged peers (Gregory, 2016; Nyembeke, 2016).

Owing to multiple roles that parents play in reducing achievement gaps, it is essential to explore the specific challenges and barriers that may prevent them from actively participating in their children's education in Tanzania. Understanding the socio-cultural context, economic constraints, and potential communication gaps between schools and families could provide valuable insights into designing effective interventions that encourage and facilitate parental engagement.

Supportive relationship between schools, parents, and the community, the education system in Tanzania can create a more inclusive and equitable learning environment for all children, irrespective of their socioeconomic backgrounds. Research on the role of education in reducing achievement gaps affirmed that involving parents and caregivers in children’s learning is crucial to reducing achievement gaps. According to Dearing et al. (2006), families' involvement in their children's schools is central to most public efforts to reduce the achievement gap between children living in low-income families and their wealthier peers. This study assessed factors that influenced parental home involvement in low-income families in Tanzania.

**Parent Involvement and Socio-Economic Conditions**
Understanding the unique challenges and opportunities within different socio-economic contexts is essential for designing targeted interventions
and support systems that can bridge the gap in parental involvement. This can promote a more inclusive and equitable learning environment.

Several studies (Abrams & Gibbs, 2002; Borgonovi & Montt, 2012; Li et al., 2000) have proven that parental involvement is very minimal in low-income families as compared to middle and higher-income counterparts. Lower involvement of low-income parents denies their children educational benefits more than children from higher-income homes (Taylor et al., 2004; Smith, 2006). As a result of this, children from low-income households who start school frequently lag behind their peers from more affluent families (Ferguson et al., 2007). If this problem remains unaddressed, the achievement gap between children from families with low incomes and those from families with moderate or higher incomes will continue to persist.

Smith (2006) argues that children who come from households with poor incomes are at a greater risk of academic underachievement than children who come from wealthy families with highly educated parents. In addition, children who originate from households with low incomes and parents with low levels of education are at an extremely elevated risk of academic failure. In order to get access to and promote parental engagement, it is vital to consider social and economic structure, which defines and stratifies parents.

Due to the presence of fee-free education, teachers have expressed their worries about the extent to which parents in public schools define their roles and engagement in their children's education (Gregory, 2016; Maliti, 2018). Therefore, it is essential to ensure that parents participate well in their children's learning process regardless their socio-economic backgrounds. In the meta-analyses, which included 95 studies of family involvement, Van Voorhis et al. (2013) proved that regardless of their background, parents from diverse backgrounds, when given direction, can become more engaged with their children learning. Moreover, when parents are more engaged, children tend to do better in school.

**Theory of Change: From School-Centric to Family-Centric Schools**

Lawson (2003) defines "school-centric" activities as primarily consisting of attendance at school-organised events (i.e., parent-teacher conferences, volunteering, parent involvement in the classroom as teachers’ aides, parent involvement on field trips, and involvement in other school related
activities. Traditional research on parent involvement is school-centric, focusing on parents’ interactions with and attendance at school events. This school-centric approach, however, fails to incorporate the conjoint influence of parenting practises, parenting styles, parent-child relationship quality, and family structure (Malczyka & Lawson, 2019). The fact that many parent participation programmes are centred on the school rather than the home is a fundamental weakness that has led to a rise in educational disparity. Pushor and Ruitenberg (2005) argue that in school-centric approaches, what constitutes "parent involvement" is defined and controlled by school administrators and teachers. It affords little or no space for parent knowledge or voice in constructing their children’s school experience or the school’s place (Stitt & Brooks, 2014). Researchers have found that parent involvement in school-centric programmes and activities is often minimal, sporadic, or non-existent (Alameda-Lawson & Lawson, 2012; Lareau, 1996). Literature on parent involvement in low-income school communities suggests that complex sociocultural and political factors may contribute to low levels of parent involvement and engagement in school-designed activities. Despite the benefits and barriers included in the parent involvement literature, it remains necessary to analyse and clarify the often-unarticulated assumptions and implicit theories of action that undergird what parent involvement means.

Walker et al. (2011) assert that schools should be skeptical of assuming that parents who are not regularly present at school are not involved in supporting children's learning; parents may provide more support for their children's schooling at home than school personnel perceive based on visibility. Kigobe et al. (2018) argue that parents are more involved in home-based activities than school-based activities. Perceptions of available time and energy are the strongest predictors of school-based involvement rather than working hours.

It is evident that school-based parental involvement might not be possible for most parents in Tanzania. That necessitates schools and teachers to think beyond the physical presence of parents as the most convenient way of getting parents involved in their children's education. The experience from the urban context of Tanzania motivated the exploration of homes in other places in Tanzania. This study aimed to understand home-based involvement in rural low-income families in Tanzania. The theory of change that assumes that motivational factors promote parental home
involvement. This helps teachers and policymakers to think about effective ways of stimulating parental involvement activities at home. Hence, studying the factors influencing home involvement activities is very crucial.

**The Hoover-Dempsey and Sandler Model of Parental Involvement**

This study employed the Hoover-Dempsey and Sandler model of parental involvement. The model underscores the multidimensional nature of parental involvement and highlights the significance of understanding the complex interactions between parents, schools, and communities in fostering effective collaboration and support for children's educational success (Hoover-Dempsey & Sandler, 1995, 1997; Walker et al., 2005).

The model is constructed around three main questions: (a) why families do (or don't) get involved in educational activities; (b) what families do when they do get involved; and (c) how family engagement in children's education improves student results. Along with the reasons parents decide to get involved, the model demonstrates how they get involved and the results of their involvement (Hoover-Dempsey & Sandler, 1995, 1997).

The model is organised into five levels that show a linear process of parental involvement. In Level one, parental involvement decisions are affected by parents' role construction, parental self-efficacy, general invitations from school, and specific invitations for involvement from the child and the child's teacher. Life context variables such as knowledge and skills, time, and energy are also considered. Level two includes the parents' choices about how they want to be involved (i.e., involvement activities at home and involvement activities at school).

Level three indicates how parental involvement affects a child's educational and developmental outcomes, including modelling, reinforcement, and instruction. Level fourth indicates the main factors that affect parental involvement, such as how well the parents' actions match up with the child's developmental needs. Finally, level five is about the outcomes for the child's learning, such as skills and knowledge, and self-efficacy for school success (Hoover-Dempsey & Sandler, 1995).

This study focused on the first and second levels of the model. It assesses how various factors surrounding parents affect their involvement choices.
Although the second level of the model describes two forms of involvement (i.e., school and home involvement), educators and teachers focus more on school involvement. Previous studies (Kigobe et al., 2018; Walker et al., 2011) have found that parents manage to be more involved at home than in school activities. Green et al. (2007) recommends examining the specific contribution of socioeconomic variables when using the model in assessing parental involvement decisions. Thus, we included parent valence towards school as suggested by Walker et al. (2005) to assess the effect of parents’ own school experiences on their presenting practices in their children's schooling.

**The Current Study**

This study used the baseline data collected in a larger project designed to promote parental involvement through capacity building (teachers' training) on parental involvement. Previous studies confirmed that parents in Tanzania are willing and positive about being involved in their children's education (Kigobe et al., 2018). Specifically, this study explored two research questions: i) what are the predictors of parental home involvement in low-income families? ii) how do parents' perceptions of involvement invitations predict home involvement compared to their personal motivators?

**METHODOLOGY**

**Participants**

The study involved parents of children from 55 primary schools in 10 districts of four regions in Northern Tanzania. In total, parents were (n = 1176), whereby a maximum of (n = 27) and a minimum of (n = 19) parents per school were involved. Among the families, 22% had only one child; 20.8% had two children; 19.6% had three children; 18% had four children; and 14.1% had five or more children. The category of parents involved mothers (52%), and fathers (48%).

Of all the involved parents, 67.7% were married, 27% were unmarried, and 5.3% did not disclose their status. Approximately 63.5% of involved parents had a low income (under 2,000 Tshs per day), 19.7% had an income ranging from 2,001 to 5,000 Tshs per day. Additionally, 7.8% were parents with a middle income between 5,001 and 10,000 Tshs per day, 4.1% had an income between 10,001 and 15,000 per day, 3% had an income of 15,001 to 20,000 per day, and 1.9% had an income of 20,001 and above per day. Regarding education level, 70.4% of involved parents
had primary education, and 7.3% were uneducated, 13.9% had secondary education, 3.2% had college certificates and diplomas, 1.4% of parents had bachelor's degrees, 0.2% had postgraduate degrees.

**Procedures**
Parents were invited to teacher-parent meetings in schools. These meetings were officiated by district and ward educational officers to bring community awareness to the importance of parental involvement. Parents were asked to sign a consent form to participate in the study and allowed their children to participate. To coordinate the exercise and minimise social desirability, 12 trained research assistants who were tutors from five teacher colleges were sent to four regions of the project to guide parents and teachers in survey administration.

**Measures**
All measures were adopted from Walker et al. (2005), who revised Hoover-Dempsey and Sandler's model of parent involvement. The study assessed home involvement (second level of the Hoover-Dempsey and Sandler model) as an outcome variable against eight predictor variables (first level of the Hoover-Dempsey and Sandler model). The predictor variables are parents' school valence, parents' role construction, parents' sense of efficacy, parents' perception of general school invitations, parents' perception of teacher invitations, parents' perception of specific child invitations, parents' knowledge and skills, and parents' energy and resources.

**The home-based involvement activities:** This was measured by four items assessing parents' academically focused home involvement activities (Walker et al. 2005). Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (never) to 6 (daily). Item examples are: (a) "Talks with this child about the school day", (b) "Supervises this child's homework". The Cronbach's alpha of this scale was .69, indicating a moderate internal consistency.

**Parents' personal Motivators**
**Parent Self-Reported Valence towards School:** This was measured by six items assessing parents' own general experiences at school, their teachers and school staff. (e.g., “My school 1 = I disliked, 6 = I liked”; “My teachers: 1 = ignored me, 6 = cared about me”). Higher scale scores indicated a stronger attraction to or good experiences with the school.
The Cronbach's alpha of this scale was .76, indicating a good internal consistency.

**Parental efficacy for helping children succeed:** This was measured by four items from Walker et al. (2005). However, two negatively worded items were deleted because of low alpha the scale provided when these two items were included. Parents rated their self-efficacy beliefs on a 6-point Likert-type scale ranging from 1 (disagree very strongly) to 6 (agree very strongly). The two items were (a) "I Know how to help my child to acquire reading skills", and (b) "I feel successful about my efforts to help my child to learn". Higher scores indicated that parents have a higher sense of efficacy. The Cronbach's alpha of the two items in the scale was .63, indicating a moderate internal consistency.

**Parents' role construction:** This was measured by nine items which describe beliefs that parent, school, and partnership focused on (Walker et al. 2005). Parents rated their role beliefs on a 6-point Likert-type scale ranging from 1 (disagree very strongly) to 6 (agree very strongly). Item examples are: "I believe it is my responsibility to (a) volunteer at the school (b) communicate with my child's teacher regularly". Higher scores indicated that parents have higher belief about their roles in children’s education. The Cronbach's alpha of this scale was .80, indicating a good internal consistency.

**Parents' perceptions of invitation to be involved**

**Parents' perceptions of general invitations from school:** This was measured by six items developed by Walker et al. (2005). Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (disagree very strongly) to 6 (agree very strongly). Item examples are: (a) "Teachers at this school are interested and cooperative when they discuss my child reading and literacy development", and (b) "This school lets me know about meetings and special school events". The Cronbach's alpha of this scale was .65, indicating a moderate internal consistency.

**Parents' perceptions of specific invitations for involvement from teachers:** This was measured by five items examining how often the child's teachers contact or make any communication with a parent (Walker et al. 2005). Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (never) to 6 (daily). Item examples are: (a) "My child's teacher asked me or expected me to help my child with..."
Parents' perceptions of specific invitations for involvement from the child: This was measured by five items. Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (never) to 6 (daily). Item examples are: (a) "My child asked me to supervise his or her homework" and (b) "My child asked me to talk with his or her teacher." The Cronbach's alpha of this scale was .82, indicating a strong internal consistency.

Parents' perceived life context variables
Parents’ understanding of their own skills and knowledge: This was measured by six items examining parents’ understanding of their own skills and knowledge (Walker et al. 2005). Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (disagree very strongly) to 6 (agree very strongly). Item examples are: “(a) I know effective ways to contact my child’s teacher (b) I know how to supervise my child’s homework.” The Cronbach's alpha of this scale was .79, indicating a good internal consistency.

Parents’ perceptions of the time and energy: This was measured by 6 items referring to how parents perceived time and energy in their decision about involvement (Walker et al. 2005). Parents rated their perceptions on a 6-point Likert-type scale ranging from 1 (disagree very strongly) to 6 (agree very strongly). Item examples are: “I have enough time and energy to (a) communicate with my child about the school day (b) attend special events at school.” The Cronbach's alpha of this scale was .68, indicating a moderate internal consistency.

Analysis
We first computed descriptive statistics, whereby Spearman correlations were calculated between the parent’s characteristics (such as gender and income) and all variables. Moreover, Pearson correlations were calculated between the outcome and all independent variables. Second, we conducted hierarchical multiple regression analyses to examine the variables that predict parental home involvement. We assessed the multicollinearity of all variables. The calculation of the variance inflation
factor (VIF) for each variable is one way to identify multicollinearity. Multicollinearity is indicated when the VIF value is larger than 1.5 for any of the variables being examined.

The multicollinearity analysis found that seven variables had tolerance values greater than 0.10 and the variance inflation factor values were less than 1.5. This indicates that there is no multicollinearity within independent variables and dependent variable. However, parents understanding of their skills, and knowledge and parents’ perception of time and energy showed a VIF of more than 2. This suggests that there is collinearity among these two variables. When VIF is too high, it is advised to remove highly correlated predictors from the model. Hence parents’ time and energy were removed from regression model.

The hierarchical multiple regression had four blocks, the first of which included three control variables (level of education, marital status, and income). The second block variables related to motivational factors (role construction, self-efficacy, and parents’ school valance) were added. The third block variables related to parents’ perceptions of invitations to be involved (general school invitations, general teacher invitations, and specific invitations from a child) were added. The fourth block variables related to parents’ perceived life context (parents’ understanding of their own skills and knowledge, and parents’ perceptions of time and energy) were added. The descriptive, correlational, and regression analyses were conducted through Statistical Package for the Social Sciences (SPSS) version 28.0 (IBM, 2021).

FINDINGS
Concerning the first analysis step, the descriptive statistics of the study variables are presented in Table 1, and Spearman and Pearson correlations are presented in Table 1. All correlations among the included study variables were observed to be significant. Analysis revealed a strong positive correlation between home involvement as an outcome variable and all eight independent variables (see table 1).
### Table 1: Correlations, Means, Standard Deviations, and Cronbach’s alphas of all Study Variables

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**Note.** * p < .05 ** p < .01 *** p < .001. Spearman non-parametric correlations were calculated between parent’s characteristics and other variables; Pearson correlations were calculated between all other variable
Predictors of parents’ home-based Involvement

The regression analysis model showed that all four blocks of the variables were significant by \( p < .001 \). The three control variables in block one contributed 4.3% of the total variance in the model, with \( F(3, 1067) = 16.04, \ p < .001 \). The variables in the second model contributed 11.5% to the variance explained by parental home involvement (\( F_{\text{change}}(3, 1064) = 48.61, \ p < .001 \)). The variables in the third block contributed 25.8% of the total variance in the model and explained parental home involvement by \( F(3, 1061) = 120.88, \ p < .001 \). Parents understanding of their own knowledge in the fourth block added 4.2% of the variance in the model. The regression analysis showed that among the first three control variables in the first block, parents’ level of education and marital status were strongly related to parental home involvement (see Table 2).

The final regression model (see Table 2) showed that parents’ perception of school invitation, parents’ perception of teacher invitation, parents’ perception of child invitation, and parents’ understanding of their own skills and knowledge were the main predictors of parental home involvement. Furthermore, parent role construction showed a mild prediction of home involvement while parents school valence did not predict parental home involvement at all (see Table 2).
Table 2. Predictors of parents’ home-based Involvement

<table>
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Note. * p < .05; ** p < .01; *** p < .001. B = Regression coefficient; Beta = Standardised regression coefficient

DISCUSSION

The primary purpose of this research study was to investigate the predictors of parental home-based involvement in low-income households living in rural Tanzania. Parents' reports, level of education, marriage conditions, general school invitations, invitations from teachers, and specific child-initiated invitations were identified as the most influential factors predicting parental involvement at home. Conversely, personal motivators and role constructions displayed relatively low predictive
power. At the same time, parents' sense of efficacy and valence towards school (based on their school experience) did not predict home involvement.

This study's findings are fascinating and insightful, showing the predictive power of schools, teachers, and child invitations in parental home involvement since these variables are usually connected to school involvement. These results are consistent with Deslandes and Bertrand (2005), who also observed that teachers and children's invitations played a role in promoting home involvement. Parents' opinions of their child's invitations were the main predictor of parental participation at home across all three grade levels. Both teachers and children's invitations played a role in encouraging home involvement. They concluded that when children personally invited their parents, they were more likely to regard their participation as desired and anticipated. As a result, parents felt obligated to be involved.

The findings revealed that parents' sense of self-efficacy and valence towards school did not predict parents' home involvement at all. Role construction was significant in some way, albeit not to the same extent as general invitations from schools, teachers, or a specific invitation from a child. Several studies, such as Walker et al. (2011) and Green et al. (2007) confirmed the prediction power of parents' perceptions of the invitation to involvement from teachers and their child. This result contrasts the findings of Kigobe et al. (2018), who, despite discovering that parents in Tanzania are more involved in home-based involvement activities, parents' sense of self-efficacy was the most significant predictor of parents' home involvement.

Based on the above findings, it is essential to acknowledge the role of schools and teachers in promoting parents' sense of efficacy and helping parents redefine their roles in children’s education. Hoover-Dempsey and Sandler (1995) affirmed that when parents have a strong sense of role formation and self-efficacy, they are more likely to be involved in their children's activities, regardless of the number of competing demands. However, this might only sometimes be the case for low-income and less-educated families, who are constantly struggling and work for many hours to sustain their families. The difficulties that come along with living in poverty are the reason for the low levels of parent involvement in school-based activities. Poverty might be why low-income parents feel more
comfortable to engage their children's education at home, at their convenience, when asked by schools, teachers, or even by their children.

Walker et al. (2011) explained that parents may be more convinced to be involved at home because opportunities for home-based involvement may appear any day and any time. Home involvement differs from school-based involvement, whose opportunities are generally limited to hours and events made available by the school. Fixed school involvement might be unfeasible for some parents because disadvantaged low-income parents are more likely to require consistent satisfaction of their essential needs before making decisions about their involvement (Hoover-Dempsey & Sandler, 1995).

The findings of this study showed that parents' level of education was a strong predictor of parents' home involvement even after the addition of parents' personal motivator variables, invitation variables, and life contextual variables in the model. In this study, most parents had a lower level of education, and their role construction and sense of self-efficacy were considerably lower. Kigobe et al. (2018) emphasized that for effective parental involvement in a child's education, teachers and schools should recognize the home as the primary starting point.

Findings showed that parents' marriage condition strongly predicted home involvement, indicating that non-married parents were more involved at home than married parents. With the active involvement of single parents, one might argue that they have more direct responsibility for their children's daily activities. The absence of co-parenting might allow some parents to make educational decisions independently, leading to a higher level of direct involvement in their child's educational journey. Also, single-parent households may experience a close parent-child bond due to the nature of shared experiences and responsibilities. A close parent-child relationship can facilitate open communication and involvement in educational matters. However, the degree of parental involvement in a child's education can vary widely, and many factors influence it. Thus, it is essential to recognize the diversity of family structures and avoid generalizations. Some studies have reported that single parenting hurts a child's academic performance (Cheung & Park, 2016). Hence, encouraging and supporting involvement from all parents, regardless of marital status, is critical to fostering a positive educational experience for children.
CONTRIBUTION OF THE STUDY AND LIMITATIONS
The study's primary contribution to knowledge lies in its focused evaluation of home as a distinct component of parental involvement in children's education. Treating home and school involvement as separate components adds depth and nuance to our understanding of parental involvement in the educational process. The recognition of home involvement as a separate aspect implies that interventions and strategies can be tailored towards addressing specific needs and challenges associated with it. This targeted approach can lead to more effective and relevant initiatives aimed at enhancing the overall quality of parental involvement in a child's education. Previous studies (Anderson & Minke, 2007; Green et al, 2007; Kigobe et al., 2018; Walker et al, 2011) have already stressed the importance of recognizing and studying parental involvement in education as a multifaceted concept. By specifically addressing home involvement as a unique dimension, this study contributes to this existing body of knowledge.

The study's focus is on families with low incomes in rural areas of Tanzania. This targeted approach not only addresses the specific needs of a particular demographic but also aligns with the context of Tanzania. Given that a large portion of Tanzanian primary school children come from low-income households, the study's focus aligns with the socio-economic reality of the country. Understanding the factors that inspire family involvement in education becomes particularly relevant in this context, and thereby contribute to the development of evidence-based strategies and interventions that are tailored to the specific needs of low-income families not only in Tanzania but also to other developing countries.

The adoption of the Hoover-Dempsey model as a framework for defining fundamental aspects of parental involvement practices in low-income families adds theoretical rigor to the study. This model is well-established and provides a structured way to analyze and understand parental involvement. The use of such a model enhances the study's conceptual framework and contributes to the overall understanding of the research phenomena.

Although the study has theoretical and practical advantages, it has some limitations. Relying solely on self-reported data through a questionnaire survey led the possibility of social desirability bias. Parents may respond...
in ways they perceive as socially acceptable or expected, potentially leading to an inaccurate portrayal of their actual behaviours and attitudes. Moreover, while using questionnaire survey is valuable for collecting large amounts of data efficiently, it may not provide a deep understanding of the nuances involved in parental involvement. Observation can offer a more in-depth perspective of home-based parental involvement including non-verbal cues, environmental factors, and the dynamic nature of family interactions.

Given these limitations, future research endeavours in this area could benefit from a mixed-methods approach. Combining questionnaire surveys with observational methods and potentially qualitative interviews can offer a more comprehensive understanding of home-based parental participation. This approach would allow researchers to triangulate data from different sources, enhancing the overall validity and reliability of the study.

CONCLUSION AND RECOMMENDATIONS

This study's findings contribute valuable insights into the factors influencing home-based parental involvement in rural Tanzania, offering practical considerations for educators, policymakers, and community stakeholders involved in enhancing parental engagement in the educational process.

Policymakers can advocate for policies that support inclusive practices in education, ensuring that all parents, regardless of educational background, feel valued and included in their child's education at school and at home. This may involve guidelines for effective communication and outreach strategies. Moreover, policymakers can allocate resources and invest in programs that specifically target parental involvement at home, recognising it as a key component of a child's overall educational experience.

Schools and teachers can adopt tailored communication strategies to reach out to parents effectively. This includes clear and personalized invitations to engage parents in various aspects of their child's education, training and workshops: Offering training sessions and workshops for both teachers and parents can address the perceived knowledge and skills gap on home involvement by providing practical tips, resources, and guidance on how parents can support their child's learning at home.
The conclusion drawn from the findings emphasizes the proactive role of schools and teachers in promoting parental involvement beyond school boundaries. The identified responsibility calls for intentional and strategic efforts to empower parents, recognize diverse backgrounds, and foster a collaborative partnership that extends the learning experience into the home environment. Schools and teachers should implement specific initiatives designed to enhance parents' effectiveness at home. These initiatives could include workshops, informational sessions, and resources aimed at equipping parents with the knowledge and skills to actively engage in their child's learning outside of the school environment.

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Science Subject Choices among Secondary School Students in Ilala-Dar es salaam: The Influence of School-Based Social and Personal Guidance

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Abstract
This study examined the influence of School-based Social and Personal Guidance (SBSPG) provided in schools on science subjects’ choices among students. Three categories of respondents were involved, including 389 secondary school students, 82 science teachers, and 10 teacher counsellors who were subjected to a Self-Report Questionnaire (SQR), a Focus Group Discussion (FGD) and a Semi-Structured interview. A Binary Logistic Regression Model was employed to analyse quantitative data collected through SRQ, while thematic analysis was applied for FGD and interview data. The findings indicated that SBSPG was found to have significant positive influence on students’ science subjects’ choices for both male and females with odds ratio (OR) 2.04 (p=0.004) for males and 1.70 (p=0.005) for females. Therefore, the study recommends that the Ministry of Education Science and Technology to strengthen the efforts to ensure that comprehensive SBSPG fully provided in secondary schools. This could add up the ongoing efforts to bridge the existing gender gap in Science, Technology, Engineering, and Mathematics (STEM) in Tanzania for sustainable development.

Keywords: School-based social and personal guidance, subject choices, science subjects, secondary school students

INTRODUCTION
Choosing subjects is one of the most significant decisions and yet a challenging task since it signifies a person’s profession in the future. It involves a series of self-assessments, acquiring knowledge about the world of work, and being aware of the connection between the subjects under study and the future career of interest (Singh & Jagdev, 2018). It
involves a series of self-assessment, acquiring knowledge about the world of work and being aware of the connection between subjects under the study and the future career of interest (Singh & Jagdev, 2018). It is at this point that making a connection becomes a challenge for most youth, especially those with little career information and limited access to career guidance (Braza & Jr., 2015). One may wish to become a medical doctor in the future; unfortunately, you may find such a person taking subjects that cannot lead him or her to become one. Cases of this nature have been observed in most students in secondary schools where their career interest mismatch with subjects they take in school (Tesha, 2020). As theorized by Frank Parson (1990), career decision should not be made unless one has successfully gained self-understanding, knows what the labour market requires, and, lastly, makes an objective and logical judgement of the two (self-understanding and the requirements of the labour market). Therefore, one needs appropriate guidance to choose subjects that definitely project future careers of interest. This is where career guidance has become vital in secondary schools to assist students not only in choosing subjects but also in achieving their social, personal, and educational goals (Zafar, 2019).

In Tanzania, students normally choose subjects of specialization as they transit from form two to form three at the secondary education level. The National Education and Training Policy of 2014 clearly stipulates that career guidance and counselling services should help students to select wisely the relevant subjects for their future and observe the importance of such subjects to themselves and national development (MoEST, 2014). Likewise, Tesha (2020) asserted that students should be assisted in making an informed decision during subjects’ selection, as this is a very important stage of their career trajectory. Failure to make a wise subjects’ choice may lead to job dissatisfaction and poor performance in the future (Hipkins & Vaughan, 2020; Rukewe & Oats, 2020). This is because, subjects that students take at secondary level determines not only programs to be taken at the college and university levels but also their future careers. Therefore, if the choice was not informed and wise enough, there is a high likelihood of incongruence between the individual’s personality characteristics and the requirements of the particular job or career. Hence, SBSPG services are vital to students, especially when they are at the stage of making decisions that affect their career trajectory, society, and their lives in general.
The movement to encourage students to learn science is not only a national concern but also the worldwide agenda. International policies and research such as the Sustainable Development Goals 2015-2030, insist on investing more efforts in scientific fields for sustainable development. This is clearly observed in goals 6, 7 and 9 which focus on clean water and sanitation, clean energy, industry, innovation, and infrastructure. However, the implementation and achievement of these goals may be a challenge if countries do not have enough human resources in the scientific fields. Again, the World Economic Forum (WEF) report 2022 shows a great need to encourage more girls and boys to participate in science since the representation in these fields is still questionable. For example, taking into account graduate from all fields in 2020/2021, the percentage of male and female graduate in Information and Communication Technologies (ICT) was 8.2 and 1.7 respectively, while in engineering and manufacturing, men were 24.6 and women were 6.6 percent (WEF, 2022). These two documents provide a big picture of the importance of encouraging students to learn science, and in the context of this study; SBSPG services may serve the intended purpose. In the same vein, various studies conducted worldwide show the importance of motivating students to learn science. For example, the report by Archer et al. (2020) in London concluded that participation in STEM (Science, Technology, Engineering and Mathematics) is widely recognized as highly important for national economic competitiveness, upward social mobility, and active citizenship. This is in line with the studies by Hafkin (2016); Huyer (2018); and Toolo (2018) in Sub-Saharan African Countries, who maintained on the need to close the gender gap in science subjects to achieve a greater representation of boys and girls in STEM careers and occupations.

In Tanzania as well, various initiatives undertaken to ensure that student learn science. The Tanzania National Five-Year Development Plan (2021/2022-2025/2026) recognizes the importance of science, technology and innovation to ensure that the country is not lagging behind in the current competitive market. The document evidently stated on the need to attract more students to learn science by improving science learning infrastructure in secondary schools such as providing ICT teaching and learning tools and supplying science laboratory equipment (Ministry of Finance, 2021). Again, the Education and Training Policy (2014) also put an emphasis on science and technology education where one of its
objectives is to have adequate number of citizens educated in science and technology to meet the national development needs. This goes hand in hand with the National development vision (2025) which emphasises on the restructuring of education system to foster creativity and problem solving skills (Ministry of Finance, 2000). In the 2022/2023 academic year, Dr Samia Suluhu Hasan, the president of the Republic of Tanzania also provided scholarship to students who performed well in the form six national examinations 2021/2022 in science combinations: PCB, PCM, PGM, CBG, PMC and CBN to join University’s science programs. This is a very important effort to ensure that more students are motivated to learn science to achieve the national agenda by having enough human resources with science, technology, and innovation skills.

Despite the government’s efforts to encourage students learn science, various studies also have been conducted in the area (Kinyota, 2020; Mabula, 2012; Mwenga, 2015) focusing on the role of science teaching and learning environment. Specifically, Mabula (2012) and Mwenga (2015) insisted on teacher-students interaction and student approach in teaching and learning science while Kinyota (2020) put emphasis on the full engagement of students in scientific inquiring to improve students’ interest to learn science. Mkimbili (2018) as well emphasized on the realization of learner-centred approach in community secondary schools in Tanzania as a means to improve teaching and learning of science subjects. However, most of the efforts focused on improving teaching and learning of science subjects’ environment. The gap of students taking science against those in arts and other subjects still exist and calls for extended efforts to attract more students to learn science (Mwenga, 2015).

The Influence of SBSPG on Students’ Science Subjects Choices

Choosing subjects is not an easy task for many youths as stated earlier. Students need to be well guided in the whole process so that, their decisions reflect their career interests in the future. Ntawigaya (2021) reports that among 135 students involved in the study, 60 percent of them were not aware of the subject combination they were studying and not comfortable with what they were studying. This indicates that, there is a danger to let students decide what subjects to take and wait until things become confusing to them. Therefore, the need to strengthen career guidance services in schools cannot be denied due to its important roles to support teaching and learning as well as assist students to make
appropriate decisions (Harry & Hafidhuddin, 2020; Zafar, 2019). Correspondingly, Amani and Sima (2015) proposed increasing access to career guidance and counselling in schools and higher learning institutions to assist students in various areas including self-awareness and career decision making. This is because there is no doubt that when students are well guided and adequately informed, the likelihood of having great self-awareness will be high to the extent that, in one way or another, facilitates decision-making. This is also revealed by Tesha (2020) thus, career guidance in schools help students to identify their career aspirations and understand career opportunities available in relation to their subjects’ choices. Hence, the intention of this study to examine the influence of SBSPG in science subjects’ choice remains valid.

This study was guided by one key question namely: What is the influence of School Based Social and Personal Guidance (SBSPG) on science subjects’ choices among secondary school students? However, the key question was supplemented by a sub-question on the practice of subjects’ choices in secondary schools.

**METHODOLOGY**

This study was conducted in ten (10) public and private secondary schools in Ilala municipality, Dar es Salaam. It was important to conduct this study in Dar es Salaam because Dar es Salaam has high enrolment rate in Tanzania mainland compared to other regions. In 2019/2020 academic year the Dar es Salaam region had a total of 231,612 students enrolled in both public and private secondary schools (MoEST, 2020). Consistently, Ilala led all other municipalities in the city, where the enrolment rate in 2020 was 79,265 while Kigamboni was 12,712; Kinondoni 40,776; Temeke 60,166; and Ubungo 38,693. Therefore, Ilala MC had a wide chance of being selected for this study. Three categories of participants were involved, including form three and four students, science teachers, and teacher counsellors from ten (10) public and private secondary schools. The selection of form four and three students was based on the fact that at this level, students had already selected their subject streams, and therefore, they were in a good position to reveal about their science subjects’ choices with reference to the SBSPG provided. Science teachers and teacher counsellors were involved bec use
Science Subject Choices among Secondary School Students in Ilala-Dar es Salaam: The Influence of School-Based Social and Personal Guidance
Christina Jerome Shuma, Fidel Dassan Gwajekera and Asia Mbwebwe Rubaba

of their responsibilities in teaching and guiding students to achieve their academic goals and handle life challenges in general.

Yamane (1967) formula:  \( n = \frac{N}{1 + N(e)^2} \) was applied to determine sample size of the students since their population was already known by the researcher (Singh & Masuku, 2014). Thereafter, stratified sampling techniques were employed to obtain various strata based on class level (form four and form three) and gender (male and female) students. After the formulation of these strata, a simple random sampling technique was performed in which pieces of paper labeled numbers one and two were randomly distributed for inclusion and exclusion criteria. Hence, those who picked number one were included, while those with number two were excluded. The stratified sampling technique enabled the researcher to study differences that existed between various subgroups of the population (Ary et al., 2010). Criterion-purposive sampling was employed to select schools, science teachers, and teacher counsellors whose enrollment rate was the criteria for schools. While teaching and guidance responsibilities were the criteria used to select science teachers and teacher counsellors, respectively.

A Mixed methods research approach employed a guided data collection process, analysis, interpretation, discussion, and reporting of the findings. The ultimate purpose of adopting a mixed-methods approach is based on the fact that the key variables – the subjects’ choices and SBSPG – cannot be well investigated by a single approach. Therefore, blending the quantitative and qualitative approaches provided an opportunity for breadth and in-depth investigation of the phenomenon under study. In terms of the quantitative aspect, ex-post facto design was employed to investigate the existing cause-and-effect relationship as proposed by Ary et al. (2010). This is because the students who were the key participants of the study had already chosen their subjects; therefore, it was important to investigate the existing influence of SBSPG in their subjects’ selection. On the other hand, a multiple-case study design was employed to collect in-depth qualitative data from students who were also subjected to FGD, science teachers, and teacher counsellors on the same research question. Yin (2014) argues that a multiple-case study design is an empirical inquiry that investigates a contemporary phenomenon within its real-life context in which multiple sources of evidence are used. Therefore, the choice of this design allowed the researcher to explore the experiences,
perceptions, and opinions of teachers and teacher counsellors on students’ science subject choices in relation to the SBSPG provided. Table 1 presents the sample size of the study.

Table 1: Selected Sample for the Study

<table>
<thead>
<tr>
<th>Schools involved</th>
<th>S.A</th>
<th>S.B</th>
<th>S.C</th>
<th>S.D</th>
<th>S.E</th>
<th>S.F</th>
<th>S.G</th>
<th>S.H</th>
<th>S.I</th>
<th>S.J</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students Form IV</td>
<td>18</td>
<td>20</td>
<td>18</td>
<td>16</td>
<td>20</td>
<td>20</td>
<td>18</td>
<td>13</td>
<td>20</td>
<td>13</td>
<td>183</td>
</tr>
<tr>
<td>Form III</td>
<td>20</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>206</td>
</tr>
<tr>
<td>Science teachers</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>82</td>
</tr>
<tr>
<td>Teacher counselors</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>48</td>
<td>49</td>
<td>47</td>
<td>49</td>
<td>49</td>
<td>50</td>
<td>44</td>
<td>49</td>
<td>44</td>
<td>481</td>
</tr>
</tbody>
</table>

Source: Field data (2022)

Data Collection Instruments
In the process of data collection, Self-Report Questionnaire (SRQ) was used to collect quantitative data, while semi-structured interviews and Focus Group Discussion (FGD) guides were employed to collect qualitative data. Thus, SRQ was designed for students who were also involved in the FGD. Again, teacher counsellors participated in the semi-structured interviews while science teachers were involved in the FGD. The SRQ consisted of thirty (30) items with five-point scales ranging from 1 (Strongly disagree) to 5 (Strongly agree). However, before administering the questionnaire, item and reliability analysis were performed to evaluate the quality of the questionnaire, and the results are as presented in Table 2:
Table 2: Results of Item and reliability Analysis of School-Based Social and Personal Guidance Measurement

<table>
<thead>
<tr>
<th>Item</th>
<th>Sign</th>
<th>Item-rest correlation</th>
<th>alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>sece_1</td>
<td>+</td>
<td>0.566</td>
<td>0.9583</td>
</tr>
<tr>
<td>sece_2</td>
<td>+</td>
<td>0.719</td>
<td>0.9571</td>
</tr>
<tr>
<td>sece_3</td>
<td>+</td>
<td>0.715</td>
<td>0.9571</td>
</tr>
<tr>
<td>sece_4</td>
<td>+</td>
<td>0.5165</td>
<td>0.9587</td>
</tr>
<tr>
<td>sece_5</td>
<td>+</td>
<td>0.3954</td>
<td>0.9596</td>
</tr>
<tr>
<td>sece_6</td>
<td>+</td>
<td>0.4424</td>
<td>0.9592</td>
</tr>
<tr>
<td>sece_7</td>
<td>+</td>
<td>0.3835</td>
<td>0.9597</td>
</tr>
<tr>
<td>sece_8</td>
<td>+</td>
<td>0.7622</td>
<td>0.9568</td>
</tr>
<tr>
<td>sece_9</td>
<td>+</td>
<td>0.5293</td>
<td>0.9586</td>
</tr>
<tr>
<td>sece_10</td>
<td>+</td>
<td>0.4743</td>
<td>0.959</td>
</tr>
<tr>
<td>sece_11</td>
<td>+</td>
<td>0.5062</td>
<td>0.9587</td>
</tr>
<tr>
<td>sece_12</td>
<td>+</td>
<td>0.4517</td>
<td>0.9591</td>
</tr>
<tr>
<td>sece_13</td>
<td>+</td>
<td>0.4428</td>
<td>0.9592</td>
</tr>
<tr>
<td>sece_14</td>
<td>+</td>
<td>0.7477</td>
<td>0.9569</td>
</tr>
<tr>
<td>sece_15</td>
<td>+</td>
<td>0.5914</td>
<td>0.9581</td>
</tr>
<tr>
<td>sece_16</td>
<td>+</td>
<td>0.7596</td>
<td>0.9568</td>
</tr>
<tr>
<td>sece_17</td>
<td>+</td>
<td>0.8078</td>
<td>0.9564</td>
</tr>
<tr>
<td>sece_18</td>
<td>+</td>
<td>0.7576</td>
<td>0.9568</td>
</tr>
<tr>
<td>sece_19</td>
<td>+</td>
<td>0.7964</td>
<td>0.9565</td>
</tr>
<tr>
<td>sece_20</td>
<td>+</td>
<td>0.7873</td>
<td>0.9566</td>
</tr>
<tr>
<td>sece_21</td>
<td>+</td>
<td>0.8155</td>
<td>0.9563</td>
</tr>
<tr>
<td>sece_22</td>
<td>+</td>
<td>0.7791</td>
<td>0.9566</td>
</tr>
<tr>
<td>sece_23</td>
<td>+</td>
<td>0.8065</td>
<td>0.9564</td>
</tr>
<tr>
<td>sece_24</td>
<td>+</td>
<td>0.7571</td>
<td>0.9568</td>
</tr>
<tr>
<td>sece_25</td>
<td>+</td>
<td>0.737</td>
<td>0.957</td>
</tr>
<tr>
<td>sece_26</td>
<td>+</td>
<td>0.6664</td>
<td>0.9575</td>
</tr>
<tr>
<td>sece_27</td>
<td>+</td>
<td>0.7025</td>
<td>0.9572</td>
</tr>
<tr>
<td>sece_28</td>
<td>+</td>
<td>0.6561</td>
<td>0.9576</td>
</tr>
<tr>
<td>sece_29</td>
<td>+</td>
<td>0.7467</td>
<td>0.9569</td>
</tr>
<tr>
<td>sece_30</td>
<td>+</td>
<td>0.6415</td>
<td>0.9577</td>
</tr>
</tbody>
</table>

Test scale **0.959**

Table 2 shows the results of the item and reliability analysis of the school-based social and personal guidance (SBSPG) measurement scale. The analysis was conducted to assess the psychometric properties of the scale, including the item-rest correlation and the internal consistency of the scales. The results showed that all 30 items of the SBSPG scale had a positive item-rest correlation, ranging from 0.3954 to 0.8155, which was...
greater than the cutoff of 0.3. This indicated that all items measured the same underlying construct, which is SBSPG. Higher correlation indicates that the items strongly correlated with overall scale score. Besides, the results showed that the alpha coefficients measure of the internal consistency of the scale was high (0.959). This suggests that the scale was reliable and consistent in measuring the SBSPG construct. Generally, a coefficient alpha between 0.6 to 0.7 is considered acceptable for research purposes, while a coefficient of 0.8 or higher is considered good in practice. On the other hand, semi-structured interview and FGD guides, and expert reviews were conducted to ensure that the questions were relevant and reflected the content intended to be measured. Thereafter, the SRQs were given to form three and form four students, and the response rate was about 95 percent. Eight (8) semi-structured interviews and seven FGDs were conducted in the selected secondary schools with the help of the assistant researcher.

Data Analysis Procedure
Quantitative data were analysed through both descriptive and inferential statistics with the help of Statistical Package for Social Sciences (SPSS IBM) version 25. Specifically, frequencies and percentages were obtained through descriptive statistics while a Binary Logistic regression analysis was performed to determine the influence of SBSPG on science subjects’ choices. In the case of qualitative data collected through FGD and Semi-structured interviews, thematic analysis was used, in which the six stages suggested by Braun and Clarke (2006) were adhered to. Thus, data were familiarized by the researcher familiarised himself with the data, followed by transcription and translations since FGD and interviews were conducted in Swahili. Thereafter, initial codes were generated, followed by defining and naming the themes and sub-themes.

FINDINGS
This section presents qualitative and quantitative findings regarding the specific research questions on the influence of SBSPG on science subjects’ choices among secondary school students.

Subject Choices in Secondary Schools
To get insight on the influence of SBSPG on science subjects’ choices, it was thought important to determine the existing practices of which secondary school students used to select subjects as they transit from form
two to form three. The researcher asked a key question that was anchored by follow-up questions in the FGD with teachers and semi structured interview with teacher counsellors. The key question asked was: what is the practice of subjects’ choices in your school? With this question, the researcher wanted to understand what teachers consider by the time students choose subjects. Among 82 science teachers involved in the FGD 75(91.46%) had the opinion that academic performance was considered the most in placing students in either science, arts or other subjects’ streams existed in a particular school. Others said on students’ interest, family influences and peer pressure. Table 3 presents the summary of the data collected through FGD with science teachers and few examples of their responses.
## Table 3: What Teachers Consider to Guide Students in Subjects’ Choices

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>FGD-Responses (Examples)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic performance</td>
<td>Form two national results</td>
<td>In most cases, we consider students results from form two national examination. Those who score many A’s in science subjects we advise them to go to science class while others go to either arts or business subjects</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Annual examination results</td>
<td>We normally assess individual students’ results from annual examinations. What we do here is that, those in top ten are actually placed in science classes while others are advised to go for arts and other subjects’ areas.</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Midterm examination results</td>
<td>Sometimes, midterm tests and examinations results are used as the base to advice students on what subjects to choose. This is because, a student may underperform in the final exams but when you track his or her continuous assessment; you find that, the progresses in particular subjects are not bad.</td>
<td>10</td>
</tr>
<tr>
<td>Interest</td>
<td>Class-attendance</td>
<td>Some students clearly show interest in certain subjects. For example, we have those who frequently attend classes, they never miss classes for subjects they like and they actually have good scores in those subjects. Others may tell you that I like biology and chemistry or English and geography; therefore, in this kind of situation, we just follow what student is interested.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Good marks</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Family influence</td>
<td>Parents relatives</td>
<td>Family members such as parents and relatives sometimes influence students to choose certain subjects. I have witnessed this in our school where some students take let say science or arts just because their parents said so.</td>
<td>4</td>
</tr>
<tr>
<td>Peer pressure</td>
<td>Friends</td>
<td>Some of our students have friends whom they trust so much. Therefore, when it comes to subjects’ choices, they sometimes follow what their friends have chosen. We have such students here whom they are in either science or arts because of being pressured by their friends and peers</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Class mates</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

*Source: Field Data November (2022)*
Similarly, during interview with teacher counsellors, academic performance was mentioned as the most factor considered to guide students in subjects’ choices. For example, one teacher counsellor from school D had this to say:

*Normally, we track students’ academic performance in various examinations specially form two national examination results. Because these results are the ones that give us the clear picture of students’ academic ability. However, sometimes you may find students scored excellent but he or she may refuse to take those subjects. I had one student in the session last year where he had good A’s in science subjects but he chooses to go for business class where he was interested.* (School D-FGD conducted in November 2022)

Correspondingly, another teacher counsellor from School B said:

*I have been teaching in secondary schools for more than ten years now and seen that academic performance determines what students should choose. For example, if it happens that a student has A’s in both science and arts subjects, we advise him or her to take science because most of our students get low marks in science especially mathematics. Therefore, when we find such student, we never miss the chance to have him or her in science classes.* (School B-FGD conducted in November 2022)

Apart from academic performance in various examinations taken by students, some of teacher counsellors involved in the interview also reported on students’ interest, family influence, and peer pressure. For instance, one teacher counsellor from School H narrated that:

*Students’ interest matters a lot during subjects’ selection. Besides examinations’ results of a particular student, we check whether that student is interested in such subjects or not. This is very important because, if he or she does not have interest in let say mathematics, it will be difficult to him or her to do better in science. Therefore, to me interest is a good guide for subjects’ selection.* (School H-FGD conducted in November 2022)

Again, another teacher counsellor from school A added that:

*Our students are sometimes told by their parents or relatives to choose certain subjects because of plans they have for them. For example, most of our students come from families involved in entrepreneurship activities. Therefore, they also want their children to be involved in those activities that are why they tell them to choose commerce and bookkeeping, which are business kind of subjects.* (School A-FGD conducted in November 2022)
The Influence of School Based-Social and Personal Guidance on Students’ Choices in Science Subjects across Gender

In this aspect, the researchers wanted to find out the extent to which SBSPG influence students to choose science subjects. Self-report Questionnaires (SRQ) and FGD were employed to collect quantitative and qualitative data from students. The quantitative results are presented in Table 4.

Table 4: The Influence of School-Based Social and Personal Guidance (SBSPG) on Students’ Choice in Science Subjects Across Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>SE</td>
<td>P-Value</td>
<td>OR</td>
<td>SE</td>
<td>P-Value</td>
</tr>
<tr>
<td>SBSPG Score</td>
<td>2.03567</td>
<td>0.5007</td>
<td>0.004</td>
<td>1.7007</td>
<td>0.3222</td>
<td>0.005</td>
</tr>
<tr>
<td>Age</td>
<td>0.7644</td>
<td>0.5055</td>
<td>0.685</td>
<td>0.3136</td>
<td>0.2872</td>
<td>0.205</td>
</tr>
<tr>
<td>Ownership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>Reference</td>
<td></td>
<td></td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.0005</td>
<td>0.0014</td>
<td>0.007</td>
<td>0.0007</td>
<td>0.0020</td>
<td>0.01</td>
</tr>
<tr>
<td>Class Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form Three</td>
<td>Reference</td>
<td></td>
<td></td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form Four</td>
<td>0.3429</td>
<td>0.6564</td>
<td>0.576</td>
<td>1.5087</td>
<td>3.2903</td>
<td>0.85</td>
</tr>
</tbody>
</table>


Table 4 presents the results of the Binary logistic regression model on the influence of school-based social and personal guidance (SBSPG) on students’ choices in science subjects across genders. The analysis was performed on the aspects of age, school ownership, and class level of the students. For males, the SBSPG score had a statistically significant positive influence on their science subjects’ choices, with an OR of 2.04 (p=0.004). In contrast, for females, the SBSPG score had a significantly positive but weaker effect as compared to males with an OR of 1.70 (p=0.005). Regarding school ownership, attending private school had a significantly negative effect on students’ choice of the science subjects for both males and females, with ORs of 0.0005 and 0.0007, respectively (both p<0.001). Besides, age and class level had no significant effect on students’ choice of science subjects. Overall, the results suggest that School-based Social and Personal Guidance can play an important role in promoting students’ choice of science subjects, regardless of gender.
On the other hand, the FGD results from students’ choices of science subjects indicated that about 86 percent of females compared to 68 percent of males reported their choice of science subjects to be highly influenced by SBSPG provided by their teacher counsellors. This is in contrary to data from questionnaire where the effect of SBSPG found to be higher to males than to females. For example, during FGD one female student from School B said that:

*When I was in form one, I did not have a plan to take science, but because our teacher counsellor used to insist on the importance of science in the future employment market, it was so easy for me to choose science* (School D-FGD conducted in November, 2022)

Similarly, another female student from School A added that:

*For sure, if it could not be my teachers’ guidance and advice, I could not take science because, at first, I thought science subjects are very difficult as others used to say. However, since in many occasions our teachers encouraged us not to be afraid of science, it motivated me a lot and I chose science. I really enjoy doing calculations in math and physics* (School A-FGD conducted in November 2022)

**DISCUSSION**

This study examined the influence of School-based Social and Personal Guidance (SBSPG) on science subjects’ choices among students in secondary schools. One key research question and a sub-question were addressed regarding the existing practice of subjects’ choices and the influence of SBSPG on science subjects’ choices in secondary schools. In the case of subjects’ choices, the findings indicated that academic performance, students’ interest, family influence, and peer pressure are the factors considered by teachers to guide students during subjects’ choices. However, academic performance represented almost 91 percent of the science teachers involved in the FGD. This implies that in order for a student to take certain subjects, he or she must have good marks in those subjects. This is determined either in the form of two national examination results, annual examination results, or midterm tests. These findings contradict other researchers’ arguments in developed countries on the aspects that teachers observe in guiding students’ subjects' choices. For example, Archer et al. (2020) in England found that students’ confidence and interest in certain subject areas predict their choices. This is also observed in New Zealand by Hipkins and Vaughan (2020) who argue that academic achievement is not the only basis for students to
choose STEM subjects; however, other factors such as career intention and students’ interests are very much regarded by career counsellors in New Zealand. This is to say that subjects’ choice is not a straightforward procedure; one needs to assess various aspects for the decision to be meaningful. As confirmed by Njeri (2020) in Kenya, academic performance, availability of resources such as science laboratory equipment, and family influence were considered reasons for students to choose science subjects. However, career development scholars hold the opinion that an individual’s personality characteristics and future career plans are very important to look upon to assist students in making appropriate career decisions (Lent & Brown, 2019; Leung, 2008). The reason for this argument could be the fact that one might have good A’s in certain subjects, but he or she may not have the plan to pursue a career in such an area.

On the other hand, SBSPG was found to have positive influence on science subjects’ choices among male and female students. However, the effect reported was higher for males than females. The reason for this may be due to the number of students who received SBSPG services. Before administering the questionnaires, the researchers first determined the number of students who received SBSPG and found that among the 40 students who filled out the questionnaire at each school, 65 percent of the male students received SBSPG while females received only 35 percent. However, during FGD the magnitude of the SBSPG effect changed, and the effect was found to be higher for female students compared to their male counterparts. These findings indicate that the provision of SBSPG plays an important role in subjects’ choices. This is in line with Dela Fuente (2019) in the Philippine who argued that teachers’ guidance had an influence on students’ science subject choices. In South Korea as well, Shin et al. (2017) documented that formal career motivation and guidance had a significant positive influence on students' decision-making and science learning. This is also true in Kenya, where Njeri (2020) advocated that 66 percent of the students involved in the study declared career guidance useful during subjects’ choices, while 34 percent observed career guidance as not useful. Thus, based on the findings of this study and those from previous studies, it can be argued that guidance and support are very important by the time a student is in the process of making an important decision that has long-lasting effects. Choosing subjects is an essential decision, and students need close
support throughout the process since many of them may lack insight into what to choose for their future career plans. Therefore, in these kinds of situations, schools have no choice but to ensure that comprehensive SBSPG is well provided to students to increase the number of science subjects’ choices by considering not only their academic performance but also their interests and future career plans.

CONCLUSION AND RECOMMENDATIONS

This study aimed to shed light on the importance of SBSPG on science subjects’ choices in secondary schools. In particular, the focus was on the existing practice of subjects’ choices and the influence of SBSPG on science subjects’ choices. In all 10 secondary schools visited, academic performance was reported to be a highly influential factor in guiding students to choose science, arts, or business subjects. Other aspects, such as students' interest, family influence, and peer pressure, were also presented by a few science teachers and teacher counsellors involved in FGD and semi-structured interviews, respectively. Correspondingly, students subjected to SRQ and FGD hold the same opinion that SBSPG had a significant positive influence on their science subjects' choices. However, the magnitude of SBSPG effects varied across genders (male and female). Questionnaire results showed that SBSPG had a high positive effect on male students’ science subjects’ choices, while the effect was weaker for females. This is contrary to the FGD data, where most of the female students involved revealed that their choices were highly influenced by the SBSPG provided to them.

Based on the findings of this study, it is recommended that academic performance should not only be regarded as a guide for students to choose subjects. Other aspects, such as interest and future career plans, may also be observed. The Ministry of Education Science and Technology has to widen its efforts to ensure that students are well provided with SBSPG in secondary schools. The belief holding this argument is that when students' doubts and negative perceptions of science subjects are well addressed, it facilitates science subjects’ choices and eventually bridges the existing gender gap in STEM. Thus, another study may be undertaken to find out why male students seem to have more access to SBSPG than females. In addition, the question of how family, peers, and gender influence students' choices may be investigated since it was not the focus of this study.
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Disparities in teaching practice corrective feedback among university teaching practice assessors in Tanzania: Implications on pre-service professional practices

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Abstract
This study examines disparities in teaching practice corrective feedback among university assessors in the Tanzanian context: Implications on pre-service professional practices. A mixed-method research design was employed to bring together different strengths and non-overlapping weaknesses of quantitative and qualitative methods. The purposive sampling technique was used to get 120 undergraduate pre-service teachers from three colleges involved in the study. Questionnaire, interview and documentary reviews were used to collect data and analyzed descriptively to provide summaries in terms of numerical counts and frequencies. The study revealed that teaching practice assessors have conflicting suggestions and non-consensus in supporting pre-service teachers when dealing with similar issues. Conflicting suggestions might pose anomalies on the course of action to be undertaken by pre-service teachers who are trying to grow professionally. The study recommends the formulation of inter-institutional consensual supervisory guidelines that could inform synergy among university teaching practice assessors and supervisors.

Keywords: Assessors, disparities, teaching practice, corrective feedback, pre-service teachers.

INTRODUCTION
Quality education is pegged upon many factors that intersect in the whole teaching and learning process (Nilsson, 2008; Blazar, 2015). Predictors of teacher quality have classically included class size, certification, types of qualification, degree earned or years of experience (Blazar, 2015). Less studies indicate pedagogical knowledge of teachers as the quality indicator (Henning, 2000). The notable principle in the context of quality education is the pre-employment training, teaching practice (TP), which is a compulsory requirement for the award of any certificate, diploma or
degree pursued in teacher education (Fry, Ketteridge & Marshall, 2009). Teaching requires expert knowledge and specialized skills acquired and maintained through rigorous and continuing study (Etkina, 2010).

As a pre-service scheme, persons aspiring to become teachers gain the initial exposure to the classroom realities of teaching through information on contents, methods, materials, experiences, models and useful tools (Avalos, 2011; Lee, 2011). Cooperative and interactive guidance from veteran teachers ensure that pre-service teachers conform to prescribed guidelines, rules and standards of teaching profession (Tang & Chow, 2007; Grossman et al., 2009; Aglehart, 2009; Kardos & Johnson, 2010; Kimani, 2014; Jansen & Merwe, 2015). Teaching practice in education is compared with the novices who go through prescribed pre-service training for would-be doctors, lawyers, engineers and pharmacists (Ogonor & Badmus, 2006; Adeoye, et al., 2008; Kimani, 2014; Jansen & Merwe, 2015). Opportunities to practice under the supervision of an experienced teacher help to improve the quality of teaching (Cuenca, 2012). As educational architects, university lecturers, have the role of guiding and assessing pre-service teachers objectively to synchronise their understanding towards professional growth and development (Cuenca, 2012; Ngara, Ngwarai & Ngara, 2013; Ngwenya, 2015). TP assessors are expected to provide confirmative and corrective feedback in their area of expertise in order to flourish in the key curriculum dimensions of teaching (Adeoye, et al., 2008; Fry, Ketteridge & Marshall, 2009). Where specialists in specific subject areas are not available, instructors in other subject areas are subcontracted to serve as TP assessors under instructions of the field guidebook describing the core elements of effective teaching.

At the abstract level, the field guidebook is seen as a starter kit for thinking about effective content and pedagogical skills, presumably designed to guarantee fairness in the delivery of educational services. However, attributes of the field guidebook are open to wide and different interpretations regarding quality teaching observed in the classroom. Corrective feedback which needs to be specific, detailed and informative enough to make TP a quality tool in teacher preparation, calls for attention to areas of improvement (Hooton-Kurtoglu, 2016; Menaa et al., 2016; Ngara & Ngwarai, 2013; Hooton-Kurtoglu, 2016). Despite the presence of the field guidebook describing the core elements of effective
teaching, and concerted efforts to identify characteristics correlated with teaching effectiveness, corrective feedback falls short of the ideal.

There are some hints supported by anecdotal evidence that TP assessors have conflicting suggestions and non-consensus in supporting pre-service teachers when dealing with similar issues (Ogonor & Badmus, 2006; Adeoye et al., 2008; Cabaroglu & Tillema, 2011; Jansen & Merwe, 2015). The lack of specificity in comments given by TP assessors reflects a gap in pre-service teachers’ conviction on the course of action to undertake. The pedagogical and content knowledge dynamics in the teaching profession pose significant anomalies towards new understanding (Boikhutso, 2010; Frith, 2020; Hobson et al., 2009; Pandey, 2009; Çimen & Komur, 2019; Frith, 2020; Kremer-Hayon & Tillema, 2002; Tillema, 2005; Cabaroglu & Tillema, 2011; Jansen & Merwe, 2015; McIntyre & Hobson, 2016). If the business-as-usual scenario remains in effect without mandated interventions, the anticipated quality of pre-service teachers will not be realized. This study aims at unravelling disparities in corrective feedback that pose barriers for aspiring teachers in the teaching profession.

Theoretical Framework
This study was guided by Social Constructionist Framework by Vygotsky, (1978). Vygotsky asserts that the most fruitful experience in learners’ education is the collaboration with more skilled partners who provide intellectual scaffold to the less experienced learners. TP assessors and heads of educational institutions were regarded as more knowledgeable and experienced in navigating through the task of a level of difficulty with the pre-service teachers’ zone of proximal development (Borich, 2007). The University of Dodoma through college of education attach pre-service teachers in various educational institutions for continuous 8-weeks liaising with heads of institutions through coordinated partnership between school personnel and instructors.

Mentoring pre-service teachers features mutual support, technical advice and classroom management tips to meet teacher-centered concerns of survival (Henning, 2000; Nilsson, 2008; Lee, 2011; Watanabe, 2013). A good teacher must among other important things, display the four elements of composure; enthusiasm, confidence, warmth, and support (Anderson, & Radencich, 2012). TP assessors as educational lodestars, need to harmonize their comments to pre-service teachers to ameliorate
the subsequent teaching (Harden & Crosby, 2000; Feiman-Nemser, 2001; Grossman et. al., 2009; Kimani, 2014; Sethusha, 2014; Ngwenya, 2015; Komorowska, 2016). A frequent criticism of teacher preparation programme is the lack of adequate provision for transfer of training from university to school classrooms though field experience. Developing teaching skills appears to be less a result of practice or experience than a result of instruction and intervention (Anderson, & Radencich, 2012). If TP corrective feedbacks are confused look, pre-service teachers might be frustrated clinging to persistent teaching dilemmas (Khun-inkeeree et. al., 2019).

METHODOLOGY
A mixed research approach was used to bring together the differing strengths and non-overlapping weaknesses of quantitative and qualitative methods. The principle of sequential methodological triangulation was applied where the quantitative phase preceded and led to the selection of suitable individuals for participation in the qualitative phase (Mugenda & Mugenda, 2003; Seidman, 2006; Tashakkori & Teddlie, 2009; Creswell, 2014; Mertens, 1998). The combination of two research methods followed the model of dominant-less dominant design, with dominant model being quantitative and findings from the two datasets were merged during the interpretation phase (Guest, 2012).

To ensure the transferability of the findings to other settings, purposive sampling was deemed proper for this study (Tobin & Begley, 2004; Bitsch, 2005). A sample of 120 third-year undergraduate pre-service teachers from the University of Dodoma was selected on the basis of the homogeneity of their degree programmes with educational-related studies. The university offers field placement in educational institutions after the second semester-based instructions and examinations. Eligibility criteria required students who participated in their TP during 2020/2021 and 2021/2022 academic year from three university Colleges-College of Education (55), College of Humanities and Social Sciences (39) and College of Natural and Mathematical Sciences (26) student teachers. These three groups represented the range of undergraduate pre-service teachers who participated in the TP session. As seniors, these pre-service teachers were in the position to reflect on TP supervision mechanisms. Furthermore, as finalists, were assumed to have freedom of expression of views on TP since they have no room to do again, hence, no blockage of information was anticipated.
Data collection tools
A hybrid of data collection tools was used to attain a valid description of disparities in TP corrective feedback. Data were collected from three sources; questionnaires, structured interviews and document review. Closed-ended questionnaires were relatively free from bias as they had predetermined response categories (Bordens & Abbott, 2011; Creswell, 2014). A single-item scale consisting variation or no variation statement about TP aspects was used in detecting differences in TP corrective feedback among supervisors. Interviews were conducted to ten selected TP supervisors at the College of education to produce an alternative set of findings (Brown et. al., 2021). Additionally, interviews were used to get feedback from a different pool of informants to cross-validate the statistical results provided through the questionnaire. Results from the documentary review were used to enhance the trustworthiness of the study from the two sets of data.

Data analysis
Quantitative data were subjected to numerical counts and percentages to provide simple summaries. Frequencies and percentages of the respondents according to disparity variables were computed. Subsequently, the analysis yielded disparities in PT corrective feedback differentials concerning categorical variables of variation or non-variation responses.

In addition to the key quantitative variables described and analyzed, TP assessors were interviewed about opinions in relation to disparities in TP corrective feedback among supervisors. Because qualitative research is labour-intensive, a small sample of 10 participants was invited for structured interview (Shah & Corley, 2006). The responses gathered were screened and categorized in various themes for analysis. Qualitative data analysis involved scrutinizing and transcribing interview responses into statements that belonged together around the major themes of the interview (Keppel & Wickens, 2004; Braun & Clarke, 2006; Stangor, 2011). Provision of quotations drawn from participants’ original data and correct interpretation of views add to the credibility placed in the truth of the study findings. Systematic analysis of the content of relevant documents - lesson plan, schemes of works, lesson notes and portfolio records were used as the evidence of comments by TP supervisors. Furthermore, assessment kits were utilized to get feedback on what needs intervention for improvement. Ethical clearance approval was sought.
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from the Research, Publications and Consultancy authority. Participants remained anonymous in the presentation of the research findings to ensure non-traceability to anyone with dishonest intentions. Participation was voluntary, therefore; the participants had the option to opt out of the study with no consequence whatsoever.

FINDINGS
In this study, TP components were sieved out of various factors affecting the quality of the teaching and learning process. 15 aspects were infiltrated around specific instructional dimensions and expounded for in-depth analysis. Redundant items were knocked out for lack of merit meaning or found interwoven in such a way that they were likely to threaten the internal validity. The 15 coded questions on corrective feedback aspects were: supervisor’s directives on the format and components of the lesson plan, comments on stages of the lesson plan, formulation of specific objectives in terms of components; audience, behavioural change, conditions and the degree of performance and in terms of objective characteristics; specific, measurable, attainable, realistic and time-bound.

Other aspects were suggestions on the innovation of teaching and learning aids, the improvisation on teaching and learning using locally available resources, remarks on schemes and records of works, amount of time devoted to supporting pre-service teachers, frequency of visits made by supervisors, supervisor’s expertise in the area of subject taught, grading procedures and indications of performance. Furthermore, portfolio records, reflection about teaching, recommendations on statement of evaluation and remarks, settings for TP and relevance of materials and teaching notes were scrutinized. Key domains in terms of variation and no variation were classified.

The findings are presented in the light of 15 deduced TP components. Responses to supervisor’s directives on the format of the lesson plan were distributed unevenly. Data on pre-service teachers 96 (80%) had a common view that there were variations in corrective feedback. Only 24 respondents (20%) were appreciative that there were no variations characterizing this aspect. In the next domain of practical variations on stages of lesson plan, 90 respondents (75%) opined that variation existed among supervisors and the rest 30 respondents (25%) felt that there was no variation. Formulation of specific objectives based on SMART criteria
results suggested that 63 (52.5%) of respondents opined variation in corrective feedback. There were consistently keeping the value almost balanced judgements tapering this aspect. 69 pre-service teachers (57.5%) admitted that there were no considerable variations in terms of corrective feedback on the formulation of specific objectives.

Data related to reflection on teaching revealed that 80 respondents (66.6%) favoured variation response. But no consistency was seen in the opinion, as 40 respondents (33.4%) favoured no variation response in this domain. These findings are consistent with those reported by Underson and Radencich (2012) who observed that pre-service teachers need reflection with feedback to learn from key aspects of their field experience. The distribution of opinions on grading procedures revealed that most of the respondents, 81 (67.6%) were confirming the opinion of variation among supervisors. The discrepancy of 39 respondents (32.4%) opined no variation in corrective feedback among supervisors. Corrective feedback related to the indication of excellent performance, a high percentage of the feedback (65.9%) with 78 respondents was evidence-based remarks made by supervisors and the remaining 42 individuals (34.1%) pinpointed no variation among supervisors. Based on portfolio records, most of the pre-service teachers 81 (67.5%) were stable on the opinion of variation response and the remaining 39 respondents (32.5%) were held up at response of no variation.

Notable among these precepts, emerged the corrective feedback on the supervisor’s expertise in the area of subject taught. 85 respondents (70.9%) had reservations that there is association between expertise in the area taught and supervision. There was considerable variation in respect of the innovation of teaching and learning aids where by 75 (64.5%) and no variation in the responses of 45 students (35.5%). Remarks on schemes and records of work had a variation of 86 (71.7%) and a non-variation of 34 (28.3%). Under the domain a written evaluation of the strengths and weaknesses remarks, a significantly higher proportion of respondents 95 (i.e., 79.2%) indicated variation in corrective feedback while the rest 25 (20.8%) illustrated the nature of the feedback in the domain did not vary. Therefore, pre-service teachers indicated little correspondence between marks and remarks made. Settings for TP which had 82 (68.4%) variation and 38 (31.6%) of no variation. In the final part of the survey respondents were asked to indicate whether remarks on the relevance of materials and teaching notes existed. Regarding this item, 82 respondents (68.3%) out
of 120 expressed their views that variation existed among supervisors while 40 (31.7%) seem to hold the opinion that there was no variation in comments regarding the relevance of materials.

**DISCUSSION**

From the analysis, the general picture that emerges is that pre-service teachers were strongly oriented in the belief that supervisors lacked consensus in dealing with similar issues. Overwhelmingly, TP featured a supervisor-dominated feedback pattern with greater variations. Only four aspects of TP including frequencies of visits made by supervisors, reflection on teaching practice, statement of evaluation and remarks and setting for TP indicated a significant relationship among categorical variables. Findings in this study are in general confirmatory by Käpylä et al., (2009), Bishop et.al., (2011) who observed that pre-service teachers have inadequate content and pedagogical knowledge about teaching. Pedagogical knowledge has been characterized as piecemeal, less structured and having more inaccuracies (Nezvalová, 2011). Furthermore, pre-service teachers might transfer their misconceptions to their students during classroom instructions. This fieldwork dilemma requires informed decisions to avoid negative implications for students’ learning as expressed by Cranton (2009). This was a significant factor in the common failure of service delivery at TP centres.

Drawing from qualitative interviews with 10 supervisors, variation results stemmed not only from the quantitative aspects. A common view amongst interviewees was that TP supervisors had a belittling nature of comments. Lack of commitment to TP directives and instructional mechanisms designated might lead to low efficiency, equitable service delivery and accountability. Furthermore, informants expressed the belief that TP supervision reports were illegible and biased compromising on the quality of teaching and so were of little help to pre-service teachers. Documents provided rich information which was not revealed through interviews and questionnaires, especially marks and remarks disparities. Documents reviewed included institutional report from regional coordinators, assessment forms, guidelines from the Ministry of Education Science and Technology (MoEST) and TP committee members’ reports. Moreover, the study evaluated pre-service teachers’ lesson plans, schemes of work and assessments as commonly used classroom artefacts in the teaching and learning process.
Scrutinizing from the documents, it appears that no universal guide for various schooling levels such as primary schools, secondary schools and teachers’ training colleges. The documentary reviewed revealed variations in different aspects including the language to be used in writing reflection reports between Kiswahili English subjects. From the examination of additional qualitative remarks provided, it is apparent that there was little correspondence between marks in various TP aspects and remarks made. These results imply that TP supervisors applied independent judgement and relied on their discretion and there is a need to change the asymmetrical power relations between supervisor and supervisee.

CONCLUSION AND RECOMMENDATIONS
The chief concern of this paper was to identify the implications of disparities in TP corrective feedback among pre-service teachers. Corrective feedback among supervisors significantly attracts a disjointed teaching and learning output. Uncertainty expressed by supervisors in making judgments points to the importance of developing a shared assessment criterion within the community of supervisors. Recent studies have reported that teachers working collaboratively in content and pedagogical knowledge is the panacea of enhancing supervisors with limited pedagogical practices. Central to the entire teaching profession standards is the concept of formulating the National Council for Accreditation of Teacher Education (Brown et. al., (2021). Given the conclusions drawn from the study objectives, inter-institutional consensual supervisory guidelines to inform synergy among supervisors is vital.

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