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**The impact of the COVID-19
pandemic on educational
inequalities in Tanzania**

Jane Mpapalika
Lucas Katera

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Abstract

This study examines the impact of COVID-19 on educational inequalities in primary schools in Tanzania, focusing on student enrolment and learning behaviour, teacher engagement, and the application of information and communications technology (ICT), in 26 primary schools. Despite government efforts to provide free education and reduce inequalities, disparities persist, particularly along rural-urban, socio-economic and gender lines. Moreover, the COVID-19 pandemic has exacerbated these inequalities through school closures and the reliance on technology-assisted teaching methods during lockdowns. Using a mixed-method approach, primary data from focus group discussions with parents and key informant interviews with government officials and teachers were triangulated with secondary information from reports, national policies, and legislation. Further secondary data was sourced from the National Bureau of Statistics. The Gini Index was calculated to measure the level of educational inequalities in both the Dar es Salaam and Dodoma regions before, during and after COVID-19. Findings reveal that COVID-19 worsened educational inequalities, with poorer children having limited access to online learning. The study highlights the need to involve stakeholders in policies addressing rural-urban and socio-economic disparities, and the need for investment in facilities, infrastructure, and teacher capacity. Incentives can attract teachers to rural areas and narrow outcome gaps, contributing to equitable education for Tanzanian children.

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Acronyms and abbreviations

FGDs

Focus group discussions

KIIs

Key informant interviews

PO-RALG

President's Office - Regional Administrative and Local Government Authority

The impact of the COVID-19 pandemic on educational inequalities in Tanzania

Jane Mpapalika
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Introduction

Education is a crucial instrument for eradicating poverty and reducing inequalities, with equal access to education being recognised as a fundamental human right, regardless of socio-economic status (Thomas et al., 2001). Aligned with this, the Tanzania Development Vision 2025 presents a strategy aimed at fostering an educated society, ensuring that everyone can benefit from the creativity, innovation, and entrepreneurial potential that education nurtures. A key milestone in the pursuit of this vision was the Tanzanian government's introduction of a fee-free education policy in 2014, which eliminated all costs associated with pre-primary and primary schooling (Al-Samarrai & Tamagnan, 2019). Registration and examination fees were previously a substantial financial burden for parents, and this policy greatly improved enrolment in schools across Tanzania: there was a 46% rise in enrolment at the national level, with some schools registering an increase of almost 190% (Joseph & Irhene, 2021).



Inequality in Tanzania is largely attributed to the “intergenerational transmission of low parental education”.

Nevertheless, the COVID-19 pandemic has severely affected Tanzania's progress in educational enrolment, exacerbated pre-existing disparities between rural and urban schools, and between low-income and wealthy households, particularly at the primary level (Sebhatu et al., 2020). School closures were imposed as a means of virus containment, and required a quick transition from conventional to online learning. Even though the closures were shorter compared to many other countries (lasting from March 2020 to June 2020), they exacerbated disparities (Makoye, 2020) especially those rooted in socio-economic factors. These disparities, based on inequalities in state spending between regions, and deep-seated wealth inequalities between households, largely manifest in

limited access to alternative learning resources, and varying availability of technological tools like internet connectivity, computers, and tablets (Makoye, 2020). As a result, students from rural areas and low-income households faced greater learning losses compared to their counterparts in urban areas or from wealthier backgrounds (Blanden et al., 2022).

Specifically, schools in rural areas often lacked the resources required for online learning such as computers, accessible and reliable internet connection, smartphones, and other digital devices due to uneven resource allocation to local authorities. This imbalance is related to disparities in government resource allocation that affect regional development. In turn, students in rural districts typically did not have access to the same quality of education as those in urban areas.

Furthermore, parents from affluent backgrounds, and those with children in private schools, generally coped better with the move to online education. They had access to resources such as high-speed internet, advanced technology, and a variety of educational materials, and were often able to work from home, supporting their children's learning (Blanden et al., 2022). Conversely, families with lower incomes and those with children in public schools lacked essential devices or materials, such as a stable internet connection, computers, radios, televisions, and books, thereby making home learning difficult (Blanden et al., 2022). The transition to online learning in Tanzania therefore underscored existing disparities in educational accessibility and resource allocation.

This raises concerns about the inclusivity and suitability of different home learning options for children worldwide, particularly in developing countries like Tanzania. Moreover, these issues are further magnified by the limited evidence available on best practices or most effective activities for home learning. This pandemic-induced situation magnified not only the socioeconomic divide, but also the differences and inequalities between public and private education.

Regarding the impact of COVID-19 on education in Tanzania, the specific lens of the pandemic's impact on educational inequality in primary education remains underexplored, resulting in a gap in the literature. Notably, in Tanzania, the pandemic affected over 14.5 million enrolled students, including more than 10 million from primary schools alone (World Bank, 2021; Msigwa, 2020). Given the sizable primary school population, understanding the impact of the crisis on this educational level can provide valuable insights into the overall effect of the pandemic on the nation's education system.

The study is guided by four primary objectives. First, it aims to understand the state and dimension of educational inequalities in Tanzania, including disparities between rich/

poor and rural/urban educational settings that have been exacerbated by unequal access to learning alternatives and technological resources. The second objective is to examine the education-related policy responses to COVID-19 in Tanzania. The third objective is to investigate how COVID-19 and associated measures have impacted students' learning performance and access to education in both rural and urban areas. Finally, the study aims to explore opportunities for improving existing policy responses to mitigate educational inequalities in the country. The analysis is based on student enrolment and learning behaviour, teacher engagement, and the application of information and communications technology (ICT) in both private and public primary schools in rural and urban areas. Both qualitative and quantitative research methods will be used, and the Gini Index will also be calculated to measure the level of educational inequalities during the pandemic in the Dar es Salaam and Dodoma regions in Tanzania.

The study is structured as follows: section 2 reviews the relevant literature on the topic, drawing on previous studies and research; section 3 outlines the methodology employed in this study; section 4 presents data analysis and the findings of the study, providing insights into the state and dimensions of educational inequalities during the pandemic; section 5 discusses the implications of the findings and identifies key areas for future research; finally, section 6 provides policy recommendations to address the educational inequalities worsened by the COVID-19 pandemic in Tanzania.

Literature review

Inequality in Tanzania is largely attributed to the "intergenerational transmission of low parental education," indicating that family background is a determining factor of educational attainment and access to skilled jobs (Hassine, 2015). Despite experiencing strong economic growth at an average of 7% in the last decade, the country's overall progress in reducing poverty and inequality has been marginal and uneven (World Bank, 2020). Between 2007 and 2012, poverty declined only by 6%, leaving 28.2% of the population below the poverty line (World Bank, 2020). This apparent disconnect between growth and poverty reduction is partly attributed to existing inequalities which limit participation of the poor in the growth process (Organisation for Economic Co-operation and Development, 2017). Despite implementation of strategies and programmes to mitigate inequality in the country, disparities persist in relation to income, education attainment, access to decent employment, and to financial, education and health services, as well as access to the ownership of productive resources like land.

However, prior to the pandemic, Tanzania had witnessed a steady decrease in educational inequality, spanning both geographical (rural-urban) and gender divides (Maliti, 2019). In an extensive analysis utilising six rounds of national-level cross-sectional Demographic and Health Surveys (1991, 1999, 2004, 2007, 2010, and 2015), Maliti (2019) documented a reduction in both educational and wealth inequality in Tanzania over the past quarter-century. The 2011-2012 Household Budget Survey found that the percentage of individuals aged 15 and above in Tanzania with no formal education had shrunk from 24% in 2007 to 19% in 2011-2012. This drop was seen more prominently in rural areas (4.3%) compared to Dar es Salaam (3.5%) and other urban regions (4.2%). Moreover, the proportion of men from poor households who were illiterate dropped from 42% in 2005 to 32% in 2010 (Matotay, 2014). Relatedly, gender inequality in education has also been on a downward trajectory, demonstrated by an improving gender balance at lower schooling levels. The proportion of girls to boys in both public and private schools across mainland Tanzania increased from 98% in 2010 to complete parity in 2012, even tipping in favour of girls in 2013, with a gross enrolment ratio of 1.022 (Maliti, 2019; Davids & Maliti, 2015). Further underscoring these positive trends, the 2011-2012 Household Budget Survey indicated a decline in the percentage of uneducated individuals for both genders, with a more significant improvement among women (dropping by 5.6% from 29.5% in 2007 to 23.9% in 2011-2012) than men (decreasing by 4.0%, from 16.9% to 12.9% over the same period) (Maliti, 2019).

Despite these encouraging trends towards educational equality, rural-urban and gender-based educational gaps remain an urgent issue. A primary concern is the discrepancy in opportunities for higher education between urban and rural areas, attributed to the enhanced accessibility and superior quality of educational resources in urban regions (Maliti, 2019). Another challenge persists in the form of stringent cultural norms defining gender roles, which often impede efforts to boost female education rates beyond the primary level (Yang et al., 2014).

Focusing on the impact of the pandemic on education, Joseph and Irhene (2021) studied how the pandemic affected the implementation of free education policy in public secondary schools in Arusha City, Tanzania. Their findings revealed only a weak positive correlation between the pandemic and policy implementation. Meanwhile, other research, such as Suru and Matete (2022) Mwakyusa and Ng'webeya (2022), and Msigwa (2020), on Tanzania, and Ndibalema (2022) on developing countries in general, examined inequalities between low- and high-achieving students, demonstrating that school closures severely reduced learning time, especially for low-achieving students. Darmody et al. (2021) studied the effect of the COVID-19 pandemic on the welfare of different social groups across developed countries in terms of education and the containment measures adopted to tackle learning loss among students from low-

income families. The study found that limited access to online learning among students from low-income families exacerbated learning losses and educational inequalities when compared to students from high-income families.

Angrist et al. (2021) modelled learning losses due to the COVID-19 pandemic and the potential for cost-effective strategies to build back better across countries including Tanzania. They used both linear and compounded estimates to compare the impact of home schooling on primary school students. Estimated losses were lower in Tanzania due to the shorter length of school closures (only 13 weeks). Another study by Angrist et al. (2020) compared over 150 education impact evaluation studies using randomised controlled trial or quasi-experimental methods across 46 low- and middle-income countries using a unified education measure (learning-adjusted years of schooling). Their review juxtaposed other studies that showed educational interventions were effective.

During the pandemic, the task of guiding primary school children fell largely to parents, sometimes aided by caregivers (Daniel, 2020; Goudeau et al., 2021; Mahundu, 2020). High-income, well-educated families were able to leverage online learning resources to ensure seamless home-based education (Goudeau et al., 2021). Such families typically had resources like high-speed internet and advanced technology, could afford tutors, and were often able to work from home, aiding their children's learning (Goudeau et al., 2021; Mahundu, 2020). Conversely, families with lower income and education levels often found themselves grappling with the challenges of homeschooling due largely to their limited educational background, inability to work from home owing to their job types, and difficult access to online learning resources (Mahundu, 2020). These disparities led to a deepening of educational inequalities, with well-educated parents able to dedicate more time to their children's education.



The possibilities of minimising educational inequalities between public and private primary schools are low due to the lack of political will to invest in technology.

Matete et al. (2023) used a cross-country analysis to investigate the benefits of e-Learning as an alternative teaching method during COVID-19 in Africa. Their findings reveal that e-learning enhances access to updated content for students and is cost-effective compared to traditional face-to-face teaching methods that require the physical

presence of teachers and physical facilities. However, researchers argue that the digital divide, unreliable internet services, and connectivity issues in African countries pose challenges to the implementation of e-learning and can further exacerbate educational inequalities between rural and urban households, and high-income and low-income groups (Adeoye et al., 2020; Dorovolomo et al., 2021; Agarwal et al., 2021). Studies by Mwakyusa and Ng'webeya (2022) and Ndibalema (2022) similarly highlight the constraints of shifting to online learning in Tanzania.

In this context of existing rural-urban dynamics in Tanzania, the possibilities of minimising educational inequalities between public and private primary schools are low due to the lack of political will in investing in technology (World Bank, 2021). Moreover, investment in primary schools was low between 2021-2022, and in 2022-2023, the government set a lower budget for primary education compared to secondary and higher education (Nchemba, 2023). However, it is worth noting that the government has allocated TZS 224 billion to the free primary education program in the current budget cycle. Furthermore, the government has set up a special funding program amounting to TZS 8 billion shillings to tackle the problem of school drop-out. However, a specific budget has never been set aside for incorporating technology in public primary schools.

Methodology

Study area

The study focuses on two contrasting regions in Tanzania, to gain a comprehensive understanding of the urban and rural educational landscapes: Dar-es-Salaam, which has been a thriving commercial centre since the 1970s, and Dodoma which—despite its relatively recent elevation to capital city status—is still undergoing socio-economic development.

Data collection was facilitated by collaboration with the President's Office-Regional Administration and Local Government (PO-RALG) and regional educational officers. Appendix 1 provides a detailed overview of the districts and schools included in this study. The Dodoma region sample comprised schools from the Dodoma Municipal Council, Bahi District Council, and Ibihwa District Council. The Dar es Salaam region was represented by schools from the Kinondoni District Council and the Dar es Salaam Municipal Council. This range of educational institutions helped capture diverse perspectives of various stakeholders in the Tanzanian educational system.

Approach

This study employed a consultative/participatory approach, involving extensive consultations and in-depth interviews with key stakeholders, including parents, teachers, and government representatives in education. It utilised both qualitative and quantitative research methods to assess the impact of COVID-19 on educational outcomes in Tanzania. The sampling process targeted key dimensions of inequality, encompassing urban and rural areas, private and public schools, gender (girls and boys), and high-income and low-income communities. The study then compared student performance from before the pandemic (academic periods 2018-2019 and 2019-2020) to performance after schools reopened (2020-2021 academic period). To determine the impact of the pandemic on student learning performance, the study used a quasi-experimental approach involving primary school students aged between 6-14 years (the standard age for primary school students from grades 1-7). It is worth noting that annual academic terms begin in January for public schools and September for private schools. This study treats the 2020-2021 academic period as a reflection of the impact of school closures on student learning performance, with the 2018-2019 and 2019-2020 academic periods serving as benchmark periods.

Sample

Within each of the four districts, two wards (urban and rural) were selected. For in-depth interviews, in each of the eight wards two primary schools (public and private) were sampled to capture socio-economic inequalities in educational levels as assessed by ward education officers. In total, 26 public and private schools were included in the sample. Key informant interviews (KIIs) were carried out with a total of 16 teachers, 5 government officials, and 4 ward education officers per region (total of 25 KIIs).

In addition, a total of 45 parents (21 males and 24 females) randomly sampled from school parents' committees across the four districts took part in individual interviews followed by focus group discussions (FGDs). A total of 10 FGDs were carried out (5 per region).

A purposive sampling technique was employed to sample public and private schools. The study includes schools in the city, which are regarded as urban areas, and schools in rural areas. The aim is to understand differences in performance across geographical locations.

Data collection methods

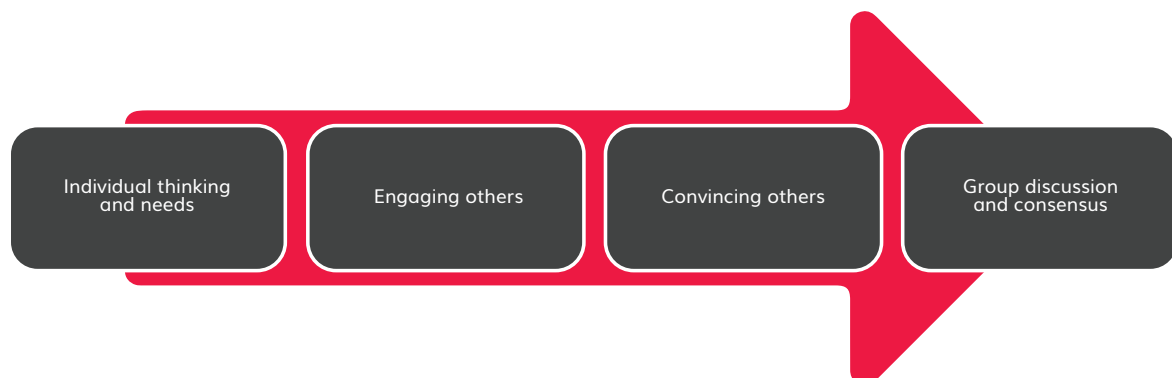
Documentary review

The study obtained secondary data through an in-depth review of key policy documents from the National Bureau of Statistics and the Ministry of Education, Science and Technology. Additional sources of information included official publications, annual reports from key stakeholder organisations and institutions, as well as peer-reviewed journals. Government policy documents were reviewed to identify policy responses to the impact of COVID-19 on educational inequalities, both in Tanzania and across Africa. This approach facilitated a comprehensive analysis of the policy measures implemented in response to the pandemic and their effectiveness in reducing educational inequalities.

Focus group discussions

The use of FGDs for data collection was deemed appropriate in assessing students' engagement in learning during the COVID-19 pandemic as FGDs provide a platform for participants to share their unique experiences and perspectives, which fosters a comprehensive and diverse response set. The study adopted a cross-validation structure, illustrated in Figure 1, whereby individual participants were first interviewed, followed by group discussions aimed at reaching a consensus on the issues raised. This method ensured that every participant had an equal opportunity to express their opinions and influence the final perception of the group.

Figure 1. Cross-validation structure of focus group discussions



Note. Elaborated by the authors.

Key informant Interviews (KIIs)

KIIs are targeted towards specific individuals of interest on a one-to-one basis (Lokot, 2021). The advantage of using the KII is that it gives first-hand information directly from the informed individuals that would otherwise be unavailable or difficult to access. KIIs generate more valuable information because of the status and expertise of the key informant. They are usually semi-structured or unstructured with open-ended questions to gather enough information from the informant.

To minimise errors or misinformation, all interviews were recorded. During the fieldwork, team members would meet at the end of each day to share and review collected information and ensure this was relevant and within the scope of the study.

Gini coefficient index

This study employs the education Gini coefficient index—which is calculated based on individuals' years of schooling—to evaluate educational inequality in Tanzania. The calculation of the education Gini coefficient follows the same principles as measuring income inequality, and can be applied to measure educational inequality as it accurately represents changes in educational distribution (Senadza, 2012). After measuring the index, a decomposition method based on the Gini coefficient was used to determine the socio-economic, rural-urban, and gender-based educational inequalities.

The education Gini index is calculated using the World Bank's Living Standards Measurement Study (LSMS) data, focusing on school-age children in Tanzania. The data analysis examines inequality by gender (male vs female), geographical location (rural vs urban), and household economic status (rich vs poor). Following Archibong (2018), this study utilises the most recent LSMS data available for Tanzania, which covers the period of 2019.

The Gini coefficient is calculated as

$$Gini = \frac{1}{\mu} \sum_{i=2}^n \sum_{j=1}^{i-1} p_i |y_i - y_j| p_j \quad (1)$$

where μ is the average years of schooling for primary school aged children, p_i and p_j measure the proportions of the population with certain levels of schooling, y_i and y_j measure the years of schooling at different educational attainment levels, and n is the number of levels attained. The values of the Gini index range between 0 and 1, where

values close to 1 suggest a high level of educational inequality and values close to 0 suggest lower levels of educational inequality.

Data entry and analysis techniques

Data collected had been entered, edited, and coded during interviews and workshop discussions. The data had also been double-checked using a code sheet to ensure quality. Quantitative data was analysed using NVivo and Kobo Toolbox followed by data cleaning and validation. Some of the most instructive phrases from the data were used to support and illuminate some of the key findings.

Ethical issues

The research was undertaken with the approval of the Tanzania Commission for Science and Technology and PO-RALG at different levels including district, ward, and village/street. Respondents were informed about the objectives of the study, and their informed consent was obtained before starting the interviews. Participants were assured of anonymity in data analysis and in the presentation of the findings in any form. In citing quotes, the names of respondents were omitted to protect their anonymity.

Limitations of the study

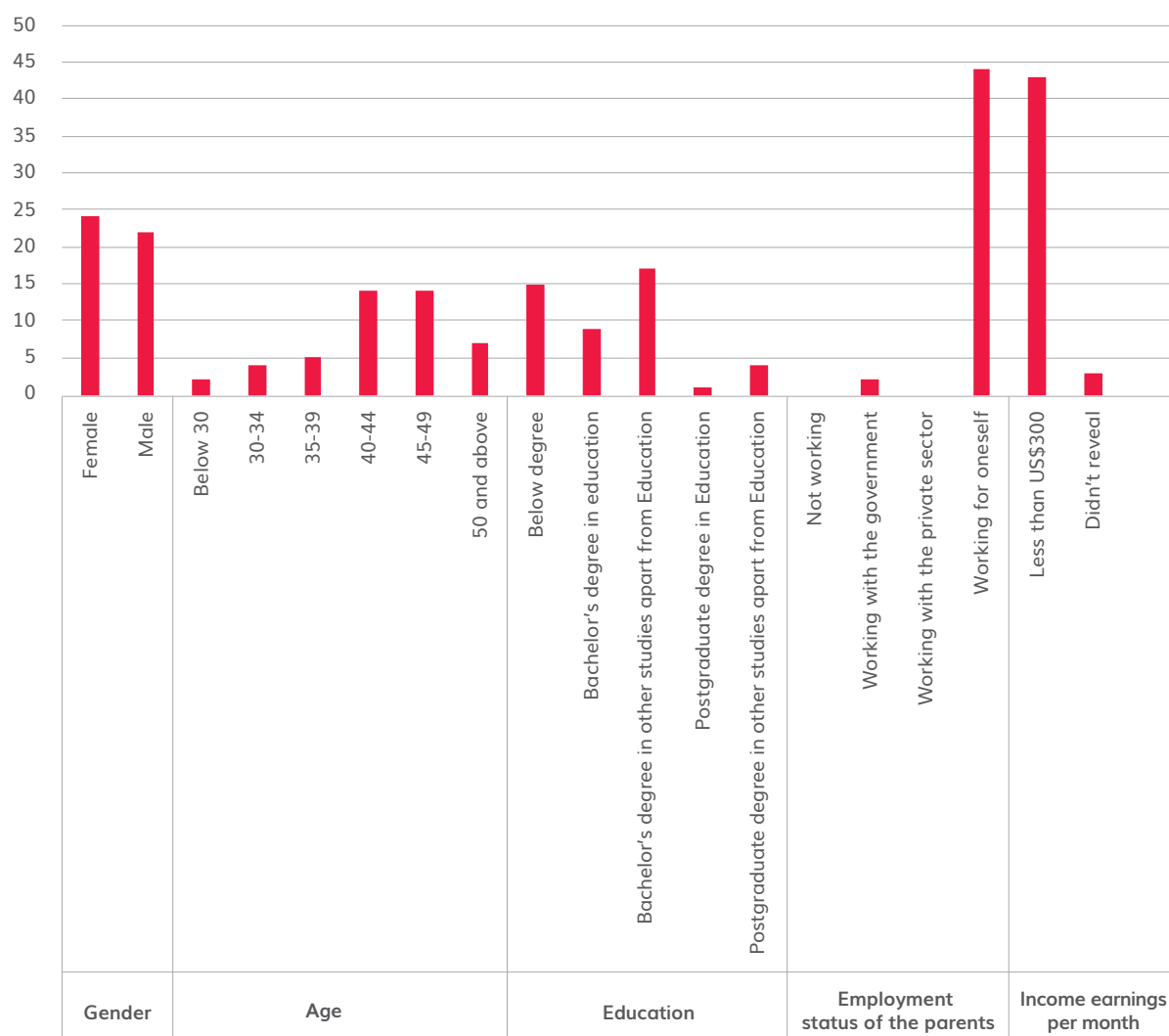
Data in different districts were collected by different researchers, thus resulting in variation in the collected data due to researcher subjectivity. To mitigate researcher bias, open-ended questions were asked to allow for all information and details to flow freely. One of the most pressing challenges encountered during the fieldwork was the lack of cooperation from Islamic private schools. In this regard, as some of the districts had more Islamic private schools, the final sample size was reduced.

Findings

Demographic characteristics

As noted in Figure 2, the average age of those taking part in the interviews and FGDs was between 40-49 years. In terms of literacy level, 56% of respondents had a minimum of a bachelor's degree and 44% had below-degree-level qualifications.

Figure 2. Demographic characteristics of the whole sample participating in interviews and FGDs



Note. Elaborated by the authors.

Perceptions of the impact of COVID on educational inequalities

Teaching engagement during school closures

During the pandemic, teachers had to pivot to alternative methods of income generation, such as part-time involvement in agriculture, due to their limited engagement in educational activities. For instance, a male teacher in his mid-40s from Ikola public school in Bahi rural district noted he was less engaged in teaching activities during the pandemic, as he worked part-time in non-academic activities such as harvesting agricultural crops to supplement his income. Similar experiences were reported by another teacher from an urban primary school as well as a young female teacher from Uhuru Wasichana private school who noted that her teaching activities, including visiting homes or phone/online teaching, were low during the lockdown. Instead, she was mainly involved in non-academic activities such small-scale agriculture and livestock activities.

Efforts to mitigate barriers that affected teacher engagement during the lockdown varied considerably between schools. For instance, one notable example came from a young female teacher at Mkoani private urban school in Dar-es-Salaam who emphasised the effectiveness of using computer technology and establishing a WhatsApp group, engaging around 50 parents in their children's education. However, in Kinondoni urban district, Mwananyamala ward, teaching engagement during school closures was not allowed at all. In light of such stark differences, it can be

seen that primary schools in Dar es Salaam had varying learning approaches during COVID-19, depending on each school's management. Some schools such as those in Mwananyamala ward, opted for total closure, regardless of the government's plea to ensure learning continuity. Yet in Msisiri B primary school in the same Kinondoni district, teachers were actively sending assignments through smartphones to parents, although only a fraction of pupils received these assignments due to lack of internet connectivity or accessibility to smartphones for many pupils and families. A teacher's response from Mkoani Primary School in Dar es Salaam further highlighted limitations in using technologically-assisted teaching



During the pandemic, teachers had to pivot to alternative methods of income generation, such as part-time involvement in agriculture, due to their limited engagement in educational activities.

methods, noting that while these methods enabled teachers to communicate with students through their parents during the three-month school closure period, only teachers with higher proficiency and skills were able to make fruitful engagement.

Moreover, teachers in Answar Private School and Deepsea Private School in the Dar es Salaam region deployed strategies such as home learning packages and pre-recorded video lessons to ensure continuity of learning during the lockdown period. Specifically, at Answar Private School, educators assembled home learning packages every week, which were then personally delivered to the pupils in a door-to-door distribution campaign every Saturday. Teachers at these schools also leveraged technology to record video clips of science lessons for level seven pupils. These lessons were disseminated to pupils via a WhatsApp group that included parents and teachers. The strategic utilisation of technology in teaching allowed the educators to maintain contact with a significant proportion of their pupils through smartphones and WhatsApp, thereby significantly enhancing teaching and student engagement during the lockdown. In the Bahi rural district's Bahisokoni public school, teachers also demonstrated a high level of commitment during the school closure. Employing innovative strategies for assignments and submission of work, the teachers used motorcycles to reach pupils residing farther away from the school, while those living closer walked to school to collect their assignments.

In the Chamwino rural district in Dodoma, according to the ward education officer, digital resources such as computers and tablets were mainly accessible to head teachers and class teachers. However, their use was intermittent and largely confined to administrative tasks such as developing and grading exams. Rural public schools such as Bahimisheni and Ibihwa public schools in the Bahi and Ibihwa districts revealed considerably lower engagement in teaching activities throughout the pandemic. These schools' lack of preparation coupled with the technological barriers faced by many students—particularly those from economically disadvantaged households—hindered access to technologically-supported teaching methods. In contrast, Ngombolola primary school in the Ibihwa ward, Bahi district, showed moderate teaching engagement in providing some learning opportunities to students by promoting home-based learning to mitigate the adverse impacts of COVID-19-induced learning loss.

The government also made efforts to support teacher engagement and student learning, such as providing textbooks, teaching materials, and capacity-building seminars for teachers, with programs like the Teachers' Continuous Professional Development programme, aiming to equip teachers with high-quality teaching skills and learning techniques. Teachers from various schools in the Dodoma district praised the government's initiatives, noting their importance in providing teaching materials, employing more teachers, and motivating those who excel through district school

competitions. As a young female teacher from Ngombolola public school in Ibihwa rural ward commented, "...the government initiatives have proved to be significant in terms of provision of teaching materials, employing more teachers, and even motivating teachers who did well in the district school competition program. The teacher whose subject did best was awarded with monetary gain as another certificate of appreciation...".

Student learning behaviour

In urban centres like Dar es Salaam, the impact of the pandemic was marked by a gendered difference in student engagement. In the Ilala ward, for example, there was a noticeable decline in learning engagement, especially among girls. An educator observed a clear difference in enthusiasm between boys and girls on school reopening, noting that "boys were more enthusiastic than girls." Some FGD participants also noted the gendered effects of the lockdown in terms of student engagement. For instance, FGD participant 1 noted that household chores impeded his daughter's access to educational television and radio programs, indicating a gender disparity in the allocation of home duties that translated into educational inequalities.

In response to the school closures, the distribution of home learning packages—comprising paper-based question sets that were distributed to homes—became a common strategy. Despite their widespread adoption, the lack of parental oversight resulted in many students missing out on their studies as they did not engage in the home learning packages. Moreover, some parents noted that their children were mostly engaged in non-academic activities during the lockdown, as FGD participant 5 stated: "the children were literally playing at home and engaged in home activities like farming" instead of engaging in home learning. FGD responses show that during the height of the pandemic children spent an average of 1 to 2 hours per day on learning activities. Other parents also raised concerns over the financial burden of the home packages, citing the costs of printing and the transportation costs for their distribution. Moreover, in Chamwino rural district, some parents were ill-prepared when it came to following up with teachers about home packages. Moreover, students who lacked access to TVs or smartphones were unable to effectively engage in learning activities, thereby leading to learning losses. FGD participant 9 commented on shortcomings of the learning modalities, noting that "these learning modalities deployed were not interactive."

While alternative learning modalities like text messages, phone calls, TV-based learning, emails, and video lessons were used, these methods—although helpful—presented their own set of challenges, largely determined by resource availability. In terms of the use of TV as an alternative learning tool during lockdowns, concerns focused mainly on the organisation and monitoring of TV-based educational programs.

For instance, FGD participant 1 voiced concerns about the scheduling and coherence across TV stations, observing that "the television programs were not well organised between one TV station and the other". Echoing this sentiment, FGD participant 5 identified monitoring as a significant issue, noting that "some children watched other TV programs instead of academic programs, especially where monitoring was weak." Similarly, this was highlighted by FGD participant 6, who remarked, "there was no monitoring whether pupils pay attention to the radio and television program or not." Despite these challenges, advantages of widened access to diverse learning materials were noted, as FGD participant 1 went on to acknowledge: "the online learning modality facilitated access to learning materials from different schools and networks."

To address these issues, FGD participants 1, 3, and 5 suggested that TV and radio programs should be well organised, and that educational institutions should involve parents in designing alternative learning methods. Likewise, to mitigate disparities in education more broadly, FGD participants noted that there is a need for improved organisation, more inclusive learning modalities, and increased parental involvement in designing alternative learning methods, as FGD participant 5 noted, "the involvement of parents in designing alternative learning methods will improve their implementation and close supervision from the parents."

Technology and education

The COVID-19 pandemic has highlighted the role of technology as a key complement to traditional face-to-face (classroom) teaching, while also underscoring existing educational inequalities between public and private schools in urban and rural districts, as well as between students from wealthier families and less affluent families. Students in rural districts often struggled to gain access or effectively use technologically-enabled learning programs, while their urban counterparts had better access and success with these platforms. For example, Mkoani Primary School, located within the Dar es Salaam urban council, and schools in Kinondoni Municipal Council exhibited high student engagement levels as students were notably well-engaged in their studies throughout the school closures, closely engaging in the home learning packages and online learning activities.

FGD participants noted differences in access to, and success with, technology-enabled learning programs among students during school closures. According to a male teacher from Gilman Rutihinda primary school in Kinondoni Municipal Council, the "teachers Continuous Professional Development (TCPD) online library program failed to be accessible to all students, leaving those in rural districts behind due to a lack of access to technology facilities". Urban students, particularly those attending private schools such as Gonzaga and Montessori, had superior access and success with these

platforms. Through the PROFUTURO¹ program, each student at these schools could access and complete online questions and receive automatic marking. After the first year of successful implementation in these regions, ProFuturo considered scaling up to other regions, including Zanzibar. However, such programs were not as widespread in public schools, with rural public schools still having less access to such programs, thereby heightening the digital divide.

Moreover, students in rural districts struggled with limited access to technology, such as TVs, radios, and computers. Rural public schools faced significant challenges in implementing technologically-assisted learning due to a lack of computers, internet connectivity, and high poverty and illiteracy levels. For example, Uguzi primary school and Chinangali primary school, both in Chamwino rural district, had no access to technological devices like computers, leading to the complete closure of both schools with no physical or technology-assisted engagement.

Furthermore, students in public schools and those from less affluent families were left behind due to limited technology-supported facilities in both rural and urban areas. An FGD participant argued that the gap between rural and urban areas in terms of technology use for education had widened during the pandemic due to low earnings, limited power supply, and lack of internet connectivity. Relatedly, many parents, particularly in the Dodoma and Dar-es-Salaam regions, had limited formal education and were struggling economically, often failing to secure formal jobs, and were unable to attain the necessary tools for alternative learning for their children. As stated by a male respondent from Dodoma rural district, "The household which cannot afford to have three meals per day [faces the] same [problem when it comes to] buying TVs or [computers] to support learning..." Therefore, the high rate of poverty in Tanzania posed constraints, as a male teacher from Bahi district explained: "...People are struggling to get their basic needs like food to eat, medical care and good shelters. They cannot think of buying computers and TVs; for them those are regarded as luxury commodities..." An additional case in point is the Answar primary school in the Mwananyamala ward where, even before the COVID-19 pandemic, some parents or guardians lacked smartphones which meant that they could not engage with teachers to obtain learning materials for their children. FGD participants noted that this digital divide not only impeded students' learning, but also led to a lack of cooperation with teachers, thereby discouraging teachers' active engagement in supporting the students.

1 PROFUTURO programme is a digital education programme that offers innovative digital teaching-learning experiences while enhancing teachers pedagogical and digital skills, as well as meaningful student learning. The programme has been implemented in Tanzania since 2016 providing high-quality delivery of programmes. According to PROFUTURO education in Tanzania, five projects have been implemented in 2017, reaching 47 public and private schools in Dar Es Salam, Morogoro, Dodoma, Moshi and Mafinga-Iringa.

There was also a worrying lack of feedback mechanisms, particularly in rural areas, and no clear strategies for monitoring and evaluation, which further impacted these efforts. For instance, a teacher from Dodoma district council highlighted, "they use posters and flyers to raise awareness on following up the TV, radio, and other learning platforms. They had no proper mechanism to know who has followed up sessions and who is not following up...". Moreover, it emerged through the FGDs that some parents in rural areas were not prompt in submitting and collecting home packages, and others boycotted the home schooling programs due to the belief that learning only took place at school.



Students in public schools and those from less affluent families were left behind due to limited technology-supported facilities in both rural and urban areas.

TV, radio, and other technologically-enabled learning sessions were attended by students with access to these platforms, primarily in urban districts. As noted by a ward education officer from Mwananyamala ward, schools in rural areas and students from low-income households were frequently unable to access these online platforms. Mlowa Barabarani public school attempted to facilitate learning through online exam papers and TV sessions, but according to our interviews, about 55% of students from the public school could not access computers and therefore missed out on education during the pandemic.

Another challenge was the low level of awareness and understanding among local communities regarding the application of technology in learning. Financial constraints, limited installation of computers, capacity gaps among teachers, and conflicting responsibilities also hindered the integration of technology in the education system. In the Ilala urban ward, it was observed that a lack of teacher motivation and cooperation from parents impaired students' performance and increased educational inequalities.

As shown in Table 1, there was a high level of agreement that technology heightened educational inequalities, as a significant number of students could not access computers due to an inability to afford electronic devices. Students in public primary schools, who were from lower-income households, often relied on home packages, as they could not afford the costs associated with e-learning.

Table 1. Parents' responses to the statement "Technology is amplifying educational inequalities"

Districts	Scores
Gerezani ward in Dar es salaam urban council	5
Kinondoni urban district	3
Bahi rural district	6
Ilala urban council	4
Dar es salaam city council	3
Buigiri rural district council	3
Chamwino rural district council	5
Mlowa barabarani rural ward in Chamwino district council	3

Note. Elaborated by the authors. Response scale from 0 (strongly agree) to 10 (strongly disagree).

Furthermore, Table 2 highlights the extent of the digital divide that is attributed to the unforeseen unprecedented outbreak of the pandemic in Tanzania. In this case, a pronounced digital divide at the primary school level is evidenced in both rural and urban district councils as the scores indicate.

Table 2. The extent of digital divide among primary schools in society

Districts	Scores
Dodoma city council	3
Bahisokoni ward, Dodoma rural district	5
Dar es salaam city council	5

Note. Elaborated by the authors. Responses are in a scale of 0 (low) and 5 (High).

Table 3 further emphasises that respondents from rural districts strongly agree that digital devices amplified educational inequalities during the pandemic compared to urban districts, given the score of 5 is the highest on the scale. Additionally, a male teacher from Mlowa Barabarani ward in Dodoma and a female teacher from Kigogo ward in Dar-es-Salaam identified community unpreparedness to use technology for virtual or

distance learning as a major factor limiting the reduction of educational inequalities. Key informants from Dodoma shared their concerns about the challenges faced in technologically-based learning, including students' unpreparedness to adapt to new learning methods, thereby leading to school dropout. Furthermore, FGD participants mostly agreed that technology amplifies educational inequalities, particularly in rural districts. For instance, students and teachers at Bahimisheni primary school could not benefit from technology due to affordability issues. However, parents in Ibihwa ward, Dodoma, disagreed, arguing that the impact of technology on educational inequalities depends on students' uptake and readiness, as well as access to educational materials. They further argued that access to technology does not guarantee improved performance, citing instances where rural district councils and low-income students outperformed their urban and wealthier counterparts.

Table 3. Digital devices amplified educational inequalities during the pandemic among primary schools

Districts	Scores
Dar es salaam urban council	3
Bahi sokoni rural ward	5
Dodoma city council	4
Dar es salaam city council	4
Dodoma Municipal Council	5

Note. Elaborated by the authors. Responses are in a scale of 0 (low agreement) and 5 (high agreement).

Regarding the impact of the pandemic on educational inequalities in primary schools across various regions (Table 4), the data reveals region-specific differences. For example, Bahisokoni Public School in Bahi Rural District shows marked disparities across all forms of inequalities under study. In contrast, responses from Dodoma City Council offer a more mixed picture. While the District Education Officer indicates moderate levels of inequality across categories, the Regional Education Officer suggests a more equitable landscape. A similar, more equitable, assessment comes from the PO-RALG Officer in Dodoma. On the other hand, Dar es Salaam City Council stands out for having the highest levels of inequalities, particularly in rural-urban and socio-economic dimensions, although it shows moderate levels of gender-based inequalities. Lastly, Chamwino Rural District Headquarters presents a unique pattern, with moderate rural-urban disparities, high socio-economic inequalities, and relatively low gender-based disparities.

Table 4. Impact of the pandemic on educational inequalities among primary schools

Schools/Regions	Rural-urban educational inequalities	Socio-economic educational inequalities	Gender-based educational inequalities
Bahisokoni public school in Bahi rural district	4	3	3
Dodoma city council (response from the District Education Officer)	3	3	2
Dar es salaam city council	5	5	3
Dodoma city council (response from the Regional Education Officer)	1	1	1
Dodoma city council (response from PO-RALG Officer)	2	2	1
Chamwino rural district headquarters	3	5	2

Note. Elaborated by the authors. Responses are on a scale from 0 (lowest) to 5 (highest)

Education Gini index

Numerous indicators have been used to measure varying aspects of education in cross-sectional studies. These indicators include enrolment ratios, educational attainment, quality by input of resources, and cognitive test scores. In terms of the distribution of education specifically, standard deviation of years of schooling was commonly used, and in recent years, the education Gini index has become the new indicator to measure education inequality. Education Gini—in line with the Gini coefficients used to measure distributions of income, wealth, and land—ranges from 0, which represents perfect equality, to 1, which represents perfect inequality. Education Gini coefficients can be calculated using enrolment, financing, or attainment data. Countries with higher educational attainment are more likely to achieve equality in education than those with lower attainment. In general terms, some of the key drivers of inequality in education are gender gaps that are clearly related to education inequality, while improving per capita GDP (adjusted for purchasing power parity) is seemingly negatively correlated with education inequality and positively related to the labour force's average years of schooling. Data shown in Table 5 indicates that educational inequality is lowest in the urban areas of Zanzibar and Dar-es-Salaam relative to rural areas, and educational inequality is lower among girls than boys.

Table 5. Educational inequalities in Tanzania

Indicators	Gini index	Number Of observation
Education		1,042
Male	0.3519	509
Female	0.3384	539
Urban	0.3133	323
Rural	0.3573	719
Dar es Salaam	0.2904	98
Mainland other urban	0.3222	215
Mainland rural	0.3650	636
Zanzibar	0.2890	93
Poor	0.3519	311
Non-Poor	0.3418	731

Note. Elaborated by the authors.

Conclusions and implications

This study provides an in-depth investigation into the far-reaching impacts of COVID-19 on educational inequalities in Tanzania. Specifically, this research aimed to shed light on the heightened disparities between students from low-income and affluent families, and between rural and urban settings resulting from school closures associated with the pandemic. By focusing on these neglected axes of difference, the study aims to contribute to policy discussions and interventions targeted at rectifying educational inequalities in a post-pandemic era.

Data collected from 108 KIIs and FGDs reveals the complexity of educational inequalities in Tanzania, and emphasises the need for multifaceted interventions. Notably, the study found that reliance on technology-assisted teaching methods during school closures has served to exacerbate existing inequalities, most markedly in rural and impoverished urban settings. In these areas, the impact of the pandemic has been

profound due to multiple factors, including the availability and affordability of digital devices, but also a lack of access to a consistent power supply and reliable internet connectivity, as well as differences in parental education levels and teacher preparedness.

The findings from this study indicate that even when digital devices were accessible, a pervasive lack of digital literacy among parents, students and teachers widened the educational gap, particularly in rural and economically disadvantaged communities. This not only amplifies educational disparities in the immediate short-term but has long-term implications, perpetuating a cycle of inequality by failing to equip students with the digital skills necessary for modern-day employability. The study therefore reveals an urgent need to not merely provide access to digital educational devices, but to establish an ecosystem that includes stable electricity, consistent internet connectivity, and essential digital literacy skills, especially in rural and impoverished urban communities.

Relatedly, the ineffectiveness of governmental initiatives to disseminate education through TV and radio in rural areas has been substantially demonstrated by the study's findings, underscoring the need for a nuanced approach to educational interventions. According to the data gathered from the Dodoma and Dar es Salaam regions, particularly in rural districts, the lack of communication infrastructure rendered these efforts futile. The study implies that this is not just an issue of content delivery, but also one of accessibility and receptivity. Students in these areas are not only unable to access educational content but are also ill-equipped to engage with it meaningfully when they can. This suggests that governmental and institutional efforts that only focus on content delivery miss the mark; there needs to be a coordinated strategy that simultaneously improves service delivery in public schools, enhances communication infrastructure, and promotes digital literacy to ensure that educational content is not just delivered but effectively engaged with.

More specifically, the study's findings, particularly those emanating from key informants in Dodoma and focus group discussions in schools like Bahimisheni primary, strongly suggest that the inadequacy of digital preparedness among teachers serves as a major barrier to mitigating educational inequalities. This is not merely a resource



Even when digital devices were accessible, a pervasive lack of digital literacy among parents, students and teachers widened the educational gap, particularly in rural and economically disadvantaged communities.

issue but also a systemic failure in the educational landscape of Tanzania. As a direct implication, there is an acute need for targeted teacher training initiatives that focus on equipping educators in rural and low-income areas with the specific technological skills needed for effective online teaching. Government and educational policy-makers must prioritise the development of localised digital training programs that are specifically designed to overcome the unique challenges faced by these teachers. In this way, and in combination with necessary infrastructural support, the cycle of educational inequality can be broken, ensuring that teachers and students in disadvantaged communities are not left behind in the digital transformation of education.

This report also highlights that beyond technology and infrastructure, educational inequalities in Tanzania are rooted in socio-cultural factors, such as teacher motivation and parental involvement, noted particularly in the Ilala urban ward. The implications of these multi-layered challenges are far-reaching. The lack of teacher motivation and inadequate parental involvement can have a compound effect, leading to a cyclical pattern of socio-economic disadvantage that extends far beyond the classroom. As such, any meaningful intervention must adopt a comprehensive approach that targets not only technological and infrastructural shortcomings, but also addresses these social and cultural barriers to achieve a sustainable reduction in educational inequalities. This underscores the need for a broader, more holistic policy framework that is sensitive to these multiple facets of educational inequality.

The findings also shed light on the financial aspects of educational disparities in Tanzania, in a context marked by high poverty rates and lack of governmental investment in online learning resources. In the context of Tanzania's struggling economy, the exacerbation of existing educational inequalities risks causing long-term damage that could span generations. The Education Gini Index, revealed that educational disparities are lowest in the urban areas of Zanzibar and Dar-es-Salaam, but are still deeply gender-biased, being notably lower among girls than boys. This highlights that the issue of inequality in educational access and quality is multi-dimensional, influenced by economic, geographical, and gender-based factors.

In summary, this study represents a vital contribution to understanding the multifaceted educational inequalities exacerbated by the COVID-19 pandemic in Tanzania. It not only emphasises the significant role of technology but also stresses the importance of socio-economic and socio-cultural factors. It brings to light the urgent need for multi-dimensional solutions that include, but are not limited to, increasing government expenditure on education, ensuring equitable access to technology, and providing comprehensive training for both teachers and students in digital literacy. The study's findings underscore the need for an all-encompassing approach to tackle

deeply-rooted educational inequalities in Tanzania, as the world navigates the challenges of a post-pandemic future.

Strategies to ameliorate COVID-19-induced educational inequalities

Addressing the educational inequalities that have been highlighted and exacerbated by the COVID-19 pandemic requires strategies which are sustainable in both the short and long term. These strategies must be adaptable, able to cater for diverse student needs, particularly those from low-income backgrounds and rural areas.

One immediate short-term solution is the widened distribution of home learning packages. These packages, containing textbooks, worksheets, and non-digital assignments, could be especially beneficial for students who have been most affected by school closures. To ensure the effectiveness of these packages, collaboration between teachers, parents, and community leaders is vital. This collaborative approach would allow the educational material to be tailored to the unique challenges and needs of each community, thereby increasing the likelihood of academic success.

Another pressing short-term action item, inspired by the Ilala urban ward findings, is the enhancement of teacher motivation and parental involvement. The study showed that teacher motivation and parental involvement significantly impact a student's educational journey. Initiating awareness campaigns focusing on parental education and emphasising community engagement could yield immediate positive results. Given the inadequate current incentives for teachers, especially those serving low-income communities, provisional measures such as increased salaries and better working conditions could significantly impact education quality. This change would not only be expected to benefit the students, but also to increase teacher retention rates, which is an important consideration for long-term educational equity.

Furthermore, given the absence of basic amenities like electricity in rural areas, immediate action should be taken to conduct an infrastructure audit and provide temporary solutions such as solar-powered generators or community-based charging stations. These could serve as a stop-gap measure, ensuring that students in these areas have access to some form of electricity, facilitating the use of electronic devices for educational purposes until more permanent solutions are put in place.

In the long term, one of the most pressing issues brought to light by the study is the widespread lack of digital literacy among teachers and students alike. This problem is particularly acute in rural areas, which the study found to be the most technologically disadvantaged. Incorporating ICT training at the elementary school level, and offering

specialised training modules for teachers must be a top priority for long-term planning. Special attention should be paid to schools in these disadvantaged areas when implementing these training programs.

Addressing the financial constraints of public primary schools, and the burden on low-income households, requires a sustainable solution that involves substantial, long-term investments in the educational sector. Current government spending is inadequate and should be augmented, potentially supplemented by international aid. Additionally, public-private partnerships could offer another avenue for resource generation, where technology companies provide much-needed infrastructure at subsidised rates. These partnerships can go beyond financial support, offering technical expertise in rolling out and maintaining digital learning platforms.

The lack of preparedness of teachers for technology-based learning requires long-term professional development programs. These programs need to be comprehensive, focusing not just on improving digital literacy but also encompassing modern pedagogical methods that incorporate technology effectively. Given the educational disparities between different regions, as revealed by the study, the creation of regional educational boards could be invaluable. These boards could conduct regular audits, research, and localised interventions that are geared towards addressing the specific educational challenges of different regions. They would work closely with local governments to ensure that initiatives are not only implemented but are also sustainable and effective in the long term.

Lastly, given the gender-biased nature of educational inequalities, as shown by the study, it is critical to introduce measures that encourage higher participation rates among girls in both schools and digital platforms. This gender-sensitive approach should be ingrained in educational policies and should be a consideration in teacher training programs, parental engagement initiatives, and the development and distribution of educational resources.

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Appendices

Appendix 1. Districts and schools covered

Regions	Districts	Wards	Schools
Dodoma region	Dodoma Municipal Council	Dodoma Makulu and Chamwino	i. Uguzi primary school ii. Chinangali primary school iii. Mlowa Barabarani primary school iv. Mloda primary school
	Bahi District Council	Mpangala and Chibeleva	i. Ngombolola primary school ii. Bahisokoni primary school iii. Bahimisheni primary school iv. Ikola primary school v. Ibiwa primary school vi. Bahi Mission primary school
	Ibihwa District Council	Ibihwa	i. Ibihwa primary school
Dar es Salaam region	Kinondoni District Council	Kinondoni and Kigogo	i. Gilman Rutihinda primary school ii. Kinondoni primary school iii. Msisiri B primary school iv. Mkwawa primary school
	Dar es Salaam Municipal Council	Gerezani and Ilala	i. Uhuru Mchanagnyiko primary school ii. Uhuru Wasichana primary school iii. Mkoani primary school iv. Al fulgaan primary school v. Answar primary school vi. Deepsea primary school vii. Gonzaga primary school viii. Ilala Islamic primary school ix. Montessori primary school x. Ilala primary school xi. Uhuru primary school

Note. Elaborated by the authors.

Appendix 2. Informed consent form

Dear Participants,

Good day. My name is _____. I am from the REPOA, an independent research organization. I do not represent the government or any political party. We are

studying educational inequalities in Tanzania. This project is part of ongoing research commissioned by Southern Voice with the objective of understanding the state of the SDGs in Asia, Africa, and Latin America. Our project focuses on Africa and seeks to understand the influence of COVID-19 on educational inequalities and strategies to strengthen the resilience of the educational sector to disruptions such as COVID-19.

Thank you. The information gathered during the conversation would only be used for research purposes with the intent of strengthening the educational system in Africa. Thank you.

Appendix 3. Instruments

INSTRUMENT – EdTech

Profile

1. Gender: Male (); Female ()
2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Highest educational qualification: Below degree (); Bachelor's Degree in Education (); Bachelor's Degree in other studies apart from Education (); Post-graduate degree in Education (); Post-graduate degree in other studies apart from Education ().
4. Years of experience in developing technological tools for the education sector: _____
5. How many people are employed in your organization? _____
- 6.

Technology and Education

7. Is there a role for technology in the future of education?
 - What do you think is the justification for your response?
8. How will you describe the acceptability of educational technology by your organization from the following educational stakeholders?
 - Government
 - School owners
 - Parents
 - Teachers
9. What is the experience of integrating technology into education?
10. From 0 (strongly agree) to 10 (strongly disagree), indicate the score that reflects your view about this statement: "Technology is increasing educational inequalities."
 - What do you think is the justification for your response?

Strategies to Ameliorate COVID-19-Induced Educational Inequalities

11. From 0 (low) to 5 (high), How will you rate the extent to which technology had been deployed to promote educational equality in the post-school closure period?
 - What do you think is the justification for your response?
12. What are the current possibilities for technology implementation in tackling educational inequalities?
13. What are the current drawbacks to technology implementation to tackle educational inequalities?

INSTRUMENT – EdTech

Profile

1. Gender: Male (); Female ()
2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Highest educational qualification: Below degree (); Bachelor's Degree in Education (); Bachelor's Degree in other studies apart from Education (); Post-graduate degree in Education (); Post-graduate degree in other studies apart from Education ().
4. Years of experience in developing technological tools for the education sector: _____
5. How many people are employed in your organization? _____

Technology and Education

6. Is there a role for technology in the future of education?
 - What do you think is the justification for your response?
7. How will you describe the acceptability of educational technology by your organization from the following educational stakeholders?
 - Government
 - School owners
 - Parents
 - Teachers
8. What is the experience of integrating technology into education?
9. From 0 (strongly agree) to 10 (strongly disagree), indicate the score that reflects your view about this statement: "Technology is increasing educational inequalities."
 - What do you think is the justification for your response?

Strategies to Ameliorate COVID-19-Induced Educational Inequalities

10. From 0 (low) to 5 (high), How will you rate the extent to which technology had been deployed to promote educational equality in the post-school closure period?

- What do you think is the justification for your response?

11. What are the current possibilities for technology implementation in tackling educational inequalities?

12. What are the current drawbacks to technology implementation to tackle educational inequalities?

INSTRUMENT – Government representatives

Profile

1. Gender: Male (); Female ()
2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Years of experience in the educational sector: Less than 5 years (); 5 – 9 years (); 10 – 15 years (); 16 years and above ()
4. Highest educational qualification: Below degree (); Bachelor's Degree in Education (); Bachelor's Degree in other studies apart from Education (); Post-graduate degree in Education (); Post-graduate degree in other studies apart from Education ()
5. From 0 (low) to 5 (high) how will you rate the impact of the pandemic on educational inequalities:
 - Rural and urban educational inequalities: _____
 - Poor and rich educational inequalities: _____
 - Male and female educational inequalities: _____

Educational interventions

We will ask government representatives in the education sector about key successful interventions, and the challenges in implementing them.

6. What were the key interventions introduced to ensure continuous learning during the height of the pandemic?
7. What is the extent of the implementation of the policy – duration, geographic, and school type?
8. To what extent do you think the intervention has been effective in sustaining learning post-school closure period?
9. What were the targeting strategies introduced by the government to reduce educational inequalities?

10. What kind of monitoring and evaluating practices were implemented to address educational inequalities?
11. What are the most critical challenges faced in implementing the interventions?

Technology and education

12. From 0 (low) to 5 (high), how important is technology in the future of education?
13. From 0 (low) to 5 (high), indicate the extent of the digital divide in society?
 - What do you think is the justification for your response?
14. Indicate from 0 (strongly agree) and 10 (strongly disagree), how true this statement is, the digital divide amplified educational inequalities during the pandemic?
 - What do you think is the justification for your response?
15. Is there a role for technology in ameliorating educational inequalities during a disruption in learning such as the COVID-19-induced closure of schools?

Strategies to ameliorate COVID-19-induced educational inequalities

16. Based on your experience, what was missing or could have been needed to tackle inequalities in student education performance?
17. What kind of engagement does the government need to incorporate in future strategies to sustain and tackle educational inequalities during future school closure?
18. What strategy is required in seeking key government representative buy-in for effective implementation of the build-back education strategy?

INSTRUMENT – Parent

Profile

1. Gender: Male (); Female ()
2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Highest educational qualification: No formal education (); Primary Education (); Secondary Education () Bachelor's Degree (); Post-graduate degree ()
4. Employment status: Not working (); Working with government (); Working with the private sector (); Working for oneself ()
5. Average combined household monthly income: Less than \$ 300 (); \$300 – \$599 (); \$600 – \$900 (); \$ 900 and above ()
6. How many children do you have? _____
7. How many of your children are in school? _____

Participated In learning-related activities at the height of the pandemic

8. During the height of the pandemic, how many hours do your children spend doing learning-related activities in a day?
9. In your opinion, do you think your child(ren) or ward continued an effective learning process during the periods their schools were closed?
 - What specific learning modalities is your child exposed to during the lockdown period?
 - What were the benefits of these learning modalities?
 - What were the disadvantages of these learning modalities?
10. How will you describe the intensity of support required for learning through online mode and physical classroom?
11. Do you have suggestions on how the learning process can be improved in the case of a future school closure scenario due to the prevailing national lockdown?
12. Do you think educational institutions should involve parents in designing alternative learning methods?
 - What do you think is the justification for your response?

INSTRUMENT – Teachers

Profile

1. Gender: Male (); Female ()
2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Years of experience in the educational sector: Less than 5 years (); 5 – 9 years (); 10 – 15 years (); 16 years and above ()
4. Highest educational qualification: Below degree (); Bachelor's Degree in Education (); Bachelor's Degree in other studies apart from Education (); Post-graduate degree in Education (); Post-graduate degree in other studies apart from Education ().

Students' learning behaviour since school reopened

5. The lockdown or school closure period had a significant impact on students' quest or enthusiasm towards learning in your class/school?
 - a. If yes, why do you think so?
 - b. If no, please also explain why you think so?
6. From 0 (low) to 5 (high) how will you rate the following in periods after school resumption:

- a. Class interaction.
 - b. Responsiveness to assignments.
 - c. Lateness to school.
7. In your opinion, did you perceive any difference between girls' and boys' quest for learning after the reopening of the school? If yes, which of the gender
- a. Please provide further context on your response and why you say so.

Engagement In teaching during school closure

8. On a scale from 1 to 10, where 1 is low engagement and 10 is high engagement, how would you rate yourself in teaching activities, including, e.g., visiting homes or phone/online communication during the lockdown period?
- a. Why did you rate your engagement this way?
9. What kind of engagement did you participate in during the lockdown period?
10. Which of these descriptions best describes your engagement during the lockdown?
- (a). full teaching, (b). short tutorials, (c). Assignments and student submissions, (d). Non-academic related engagement, (e). A combination of at least two of the options
11. How will you describe the teaching method deployed during the lockdown period –
- (a). Only physical engagement, (b). Technology-assisted engagement, (c). Both a and b.
12. Did you or your student have technology tools to ensure continuous learning during the closure of school? If yes, to what extent was technology availability to you or your pupils serve as a barrier or booster to your teaching method?
- a. Please, give more details for clarity.
13. To what extent do you think your technological proficiency influenced the extent of your engagement with your pupils?
14. Before the pandemic and during the school closure period when learning took place online, what do you think is the level of student engagement? Rate between 0 to 10.
- 0 (low participation) to 10 (high participation)
 - What do you think is the justification for your response?

Awareness of educational interventions

The participants will be provided with a list of policy initiatives and asked whether they are aware of the policies.

15. For those that are aware, the follow-up question would be:

- i. From 1 (lowest) to 10 (highest), how will you rate the effectiveness of listed government initiatives (we are still harvesting government interventions) in supporting students' learning? and
 - What do you think is the justification for your response?
 - ii. From 1 (lowest) to 10 (highest), how will you rate the effectiveness of listed government initiatives (we are still harvesting government interventions) in promoting educational equality?
 - What do you think is the justification for your response?
 - iii. How will you describe the policy initiative by the government?
 - iv. What is the likelihood that the initiative will be sustained by the government?
16. As a teacher and based on your experience, what was missing or could have been needed to ensure greater educational equality?

Strategies to ameliorate COVID-19-induced educational inequalities

17. In your opinion, what do you think are the ways for building back the educational system associated with the Covid-19 lockdown/school shutdown?
18. What are the likely factors that would limit the effectiveness of the proposed strategies in reducing education inequalities at gender, geographical, and income level?

Technology and education

19. From your experience, what is the role of technology in the future of education?
20. What do you think are the current drawbacks to technology implementation in the educational system?
 - Could you describe three ways that technology could be best embedded in reducing learning outcome inequalities?
21. What was your experience of the level of technology in teaching in the period of school lockdown?
 - Explain the learning differences that existed between male and female students.
 - Explain learning differences that existed between rural settings and urban settings.

INSTRUMENT – Parent

Profile

1. Gender: Male (); Female ()

2. Age: Below 30 (); 30 – 34 (); 35 – 39 (); 40 – 44 (); 45 – 49 (); 50 and above ()
3. Highest educational qualification: No formal education (); Primary Education (); Secondary Education () Bachelor's Degree (); Post-graduate degree ()
4. Employment status: Not working (); Working with government (); Working with the private sector (); Working for oneself ()
5. Average combined household monthly income: Less than \$ 300 (); \$300 – \$599 (); \$600 – \$900 (); \$ 900 and above ()
6. How many children do you have? _____
7. How many of your children are in school? _____

Participated in learning-related activities at the height of the pandemic

8. During the height of the pandemic, how many hours do your children spent doing learning-related activities in a day? **Average hours a day**
9. In your opinion, do you think your child(ren) or ward continued an effective learning process during the periods their schools were closed? **Yes/No**
 - a. What specific learning modalities was your child exposed to during the lockdown period?

	Yes	No
Mobile phone calls		
Text messages		
Email		
Radio broadcast		
TV broadcast		
Video lessons (e.g., zoom, skype, etc.,)		

What were the benefits of these learning modalities?

What were the disadvantages of these learning modalities?

10. How will you describe the intensity of support required for learning through online mode and physical classroom? **0(low intensity) to 10(high intensity)**
11. Do you have suggestions on how the learning process can be improved in the case of a future school closure scenario due to the prevailing national lockdown?
12. Do you think educational institutions should involve parents in designing alternative learning methods? **Yes/No**

What do you think is the justification for your response?

13. From 0 (decreased) to 10 (increased), How will you rate the learning performance of your child(ren) after the lockdown compared to before the pandemic?

14. If you have girls and boys, which of the gender participated more actively during the learning through online mode or during distance learning? Why?

Did you hire a tutor or spent more time on learning activities with your children during the height of the pandemic? **Yes/No**

15. Justification for the response (Why)?

16. How will you describe the engagement of your child(ren) when the schools re-opened? Rate their enthusiasm 0(low) to 10(high)

- Going back to school
- Completing homework/assignment
- Discussing about school/class activities

Technology and education

17. Is there a role for technology in the future of education? **Yes/No**

What do you think is the justification for your response?

18. How will you describe the pace of the introduction of technology at the school your child(ren) is attending?

19. What are the technology tools that your children mostly use and for what? And why?

	Not applicable	Lessons	Sending notes	Assignment receipt	Class sessions	Group discussions	Personal follow up
Mobile phone calls							
Text messages							
Email							
Radio broadcast							
TV broadcast							
Video lessons (e.g., zoom, skype, etc.,)							

20. If you are not using technology, what will be your recommendation to support your student learning?

21. From 0 (strongly agree) to 10 (strongly disagree), indicate the score that reflects your view about this statement, technology is amplifying educational inequalities.

- What do you think is the justification for your response?



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