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Landscape report on digital education in Tanzania

Author: Jessina Nieminen, Aalto University School of Business. June 2020.

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1. Executive summary

The role of companies, NGOs, startups, and the civil society seem to have a remarkable role in supporting digital learning in Tanzania. In primary and secondary schools, digital tools are not very widely utilized in learning; there are large differences between private and public schools, and urban and rural areas regarding internet connections and the use of digital devices. Thus, the role of non-governmental actors, such as startups and NGOs, is important in enhancing the effectiveness of a digital education agenda also outside of the classroom.

During the past few years, the Tanzanian government has been working on initiatives to improve access to public services, including education. Organizations and companies, for example, in the telecommunications industry, have supported this endeavour. In order to promote more inclusive education opportunities, the government of Tanzania has set a Fee-free Basic Education Policy aiming to enable everyone to have access to basic education. However, as a very youthful country, with about two-thirds of the population under the age of 25, the scale of the resources needed is vast as it pertains to the capacities and resources available.

Moreover, the population of Sub-Saharan Africa is projected to double in the next thirty years, complicating the already challenging situation with regard to access to education. The government has made efforts to reduce the poverty rate; however, as the young population is growing, the quality of services has not been able to keep up with the growth. Therefore, in many Tanzanian schools, a very large number of students in one class with only one teacher is common; thus, the teaching is not often personalized to each student's learning pace.

Interviews with Tanzanian digital education organizations were conducted as this report was made. According to the discussions, the majority of students are not learning the essential twenty-first century skills needed to meet industry demands. The reasons are often related to the region, infrastructure, devices, skills, and overall resources available.

The major issue with access to education is the lack of internet connectivity and reliable electricity especially in rural areas. However, there are several technologies in Tanzania that enable learning offline with SMS chatting or through broadcast media. However, lack of power supply is an issue even with the offline devices. Apart from the connectivity issue, there were several other issues identified and addressing them could support overcoming education obstacles. The recommendations section aims to provide NGOs with some suggestions for actions to take. The key is to provide essential training, skills, and support to teachers and students to better use the devices that are already in schools, as well as raise awareness on available learning opportunities for students.

Finally, as more inclusive education in Tanzania is addressed with Fee-free Basic Education Policy, digital education still needs to be spread more inclusively across different regions and groups to avoid a larger gap in digital and other twenty-first

century skills. It is evident that more resources are needed to increase digital learning opportunities in Tanzania. However, the number of startups, NGOs, accelerators, and hubs in Tanzania and across East Africa seems promising while working towards advancing digital skills education.

1.1 Scope of the report

This report is commissioned with the intent to develop a landscape analysis of the education technologies and solutions in Tanzania. The scope of the report is as follows:

i)   Describing the economic and sociocultural situation before the COVID-19 pandemic and addressing some of the impacts it has on the economy and the education sector.

ii)   Describing the current policies and government initiatives related to social services, specifically education and digital education.

iii) Mapping the availability of internet connections, ICT equipment, and electricity, as well as addressing the shortage of teachers in primary and secondary level institutions in Tanzania.

iv)   Mapping organizations and startups that are providing education through digital education solutions such as devices, platforms, or content in Tanzania with a focus on pre-school, primary, secondary, university education, and professional training for adults.

v)   Mapping some key NGOs and education programmes in Tanzania.

vi)   Providing recommendations for NGOs for actions to take in improving digital education in Tanzania based on the background research and interviews with locals.

2. Background

2.1 The political and economic context

The United Republic of Tanzania is presidential republic. President John Pombe Magufuli has been the president since 2015. The president and the parliament serve a 5-year term. The next presidential and parliamentary elections will be held in fall 2020.[1] Therefore, as there may be changes in the government composition and political landscape, changes in emphasized or prioritized areas and sectors are possible; for example, regarding the social services and education sector.

Tanzania is largely a market economy, though the government has a presence is

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[1] Central Intelligence Agency, 2020; The World Bank, 2019b.

some sectors, such as telecommunications, banking, and energy.[2] The Gross Domestic Product, the GDP, of Tanzania has been growing on average six to seven percent, per year over the past decade.[3] However, because of the implications of the COVID-19 pandemic, the GDP growth is expected to be cut at least in half in 2020.[4] The GDP, per capita in 2017 dollars was 3,200 USD on a purchasing power parity basis, making Tanzania one of the least developed countries by the GDP.[5] By the Human Development Index, the HDI, of 0.528 in 2018, Tanzania was 159 out of 189 countries and areas listed, positioning it in the low human development category. The HDI value of Tanzania, however, has been improving during the past few decades, as for example, the expected years of schooling have increased from 5.5 in 1990 to 8.0 in 2018. During this time, the HDI value has increased by 41.8 percent.[6]

The income category of the country is classified as low income.[7] In 2016, the poverty rate was estimated to be 26.8%, which was reduced during the previous decade from the rate at 34.4% in 2007.[8] Despite the reduced poverty rate, as the population grows fast, the absolute number of poor people has remained at about 13 million[9]. The government has made efforts to lower the poverty rate as well as to expand access to public services such as education, health, and water access, however, due to the high population growth the quality of services has declined when their supply has not been able to keep up[10]. During the pandemic situation in 2020, however, the situation is even more challenging; according to a recent release by the World Bank, the crisis caused by the COVID-19 pandemic could push 500,000 more Tanzanian citizens to live under the poverty line.[11] The international poverty line is 1.90 USD per person per day.[12]

In Tanzania, there have been recognized challenges with regard to corruption; for example, according to Transparency International (2019), Tanzania was ranked 96 out of 180 countries for the level of corruption. According to the ranking, the systems in the country experience relatively high corruption compared to other countries ranked.[13] In Tanzania, the level of corruption has been rather high and has been considered as a problem across sectors in the economy.[14] According to research by Transparency International in 2013, 74 percent of respondents found that the education system was corrupt, being among the most corrupted sectors listed.[15] In 2020, the ease of doing business ranking in Tanzania was 141 out of 190 and doing

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[2] Central Intelligence Agency, 2020.
[3] Central Intelligence Agency, 2020; The World Bank, 2019b.
[4] World Bank Group, 2020b.
[5] Central Intelligence Agency, 2020.
[6] UNDP, 2019.
[7] World Bank Group, 2020b.
[8] The World Bank, 2019b.
[9] The World Bank, 2019b.
[10] The World Bank, 2019b.
[11] The World Bank, 2020c.
[12] The World Bank, 2019a.
[13] Transparency International, 2019.
[14] GAN Integrity, 2016; Lindner, 2014.
[15] Lindner, 2014.

business score 54.5 out of 100.[16] According to this ranking there were a relatively high number of obstacles to having access to doing business in Tanzania related to the regulatory environment as it pertains to local firms, for example, starting a business.[17] However, as a result of efforts to address these matters in different sectors, Tanzania has improved in its overall governance indicators between 2015-18, as shown by the Mo Ibrahim Index of African Governance.[18]

2.2 Socio-cultural context

Tanzania is one of the most populous East African countries, with the population of 56.32 million in 2018[19] and the estimate of 58.55 million in 2020.[20] Almost one-third of the population is urban,[21] meaning that two-thirds live in rural areas, where there are fewer possibilities for education compared to urban areas.

The languages spoken, are Kiswahili or Swahili (Kiunguja in Zanzibar), as well as English. These languages are considered as official languages of the country in administration and education, however English is used in secondary and higher education, and commerce.[22] However, as Swahili is common language for many, it is beneficial to use the language in informal settings or when communicating with people at the grassroots level.[23] Also Arabic and many local languages are spoken.[24] The total population literacy rate in 2015 was 77.9 percent, meaning that one is able to read and write Kiswahili/Swahili, English, or Arabic. The inequality of literacy rates between genders can be seen in that the male literacy rate was 83.2 percent, being higher than that of female, at 73.1 percent, according to estimates in 2015.[25]

The population in Tanzania is very youthful; about two-thirds of the population is under 25 years old and is growing rapidly.[26] The population in Sub-Saharan Africa is expected to continue to grow at a rapid pace into the near future. The population is projected to double by 2050.[27] Due to this rapid increase in population, different educational obstacles and inequality are increasing. Therefore, the role of education is increasingly important. In future, digital education solutions need to be able to handle an even larger, faster growing population.

One of the reasons for the high population growth is the lack of sexual and reproductive health knowledge, for example, related to maternal and infant mortality and infectious diseases. For example, according to statistics, the usage of

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[16] The World Bank, 2020a; World Bank Group, 2020a.
[17] World Bank Group, 2020a.
[18] The World Bank, 2019b.
[19] World Bank Group, 2020a.
[20] Central Intelligence Agency, 2020.
[21] Central Intelligence Agency, 2020.
[22] Central Intelligence Agency, 2020.
[23] Business Finland, 2018.
[24] Central Intelligence Agency, 2020.
[25] Central Intelligence Agency, 2020.
[26] Central Intelligence Agency, 2020.
[27] United Nations, n.d.

contraception was only 38,4 percent in years 2015 and 2016[28] and the fertility rate at 5.2, increasing demand for education and health services.[29] Girls' access to education across Tanzania is affected by traditional attitudes towards girls working and helping at home instead of going to school,[30] and by early marriage and/or pregnancy.[31] Also, the long distances girls have to travel to schools is an obstacle to many girls to getting an education, as girls face the danger of being abused on their way to school.[32] In response to this, gender-inclusive education with more awareness on health, education, and opportunities are needed.

2.3 Energy and technology context

Access to electricity in Tanzania is still very low. The population without electricity remains high, at 39 million people in 2017. The electrification rate in rural areas was only 17 percent, compared to urban areas at 65 percent, which works out totalling to only 33 percent of the total population of Tanzania having access to electricity.[33]

The improvement in the access to electricity is necessary for education technologies to be widely utilized around the country, as these technologies are dependent on electrification, to be able to charge the devices. Moreover, the education platforms are often run using apps on devices that require an internet connection. However, some innovations provide interactive offline SMS learning by text messaging as well, where no device with online connection is needed. As the access to electricity is so low in Tanzania, the schools and education institutes in general may be the only way for a student to access electricity and technology, thus the role of education institutes is important in improving IT skills.

The usage of mobile, cellular phones, by a 2018 estimate, was 78 per 100 inhabitants. However, the internet usage, by a 2016 estimate, was only 13 percent of the whole population. In addition, by a 2018 estimate, there were only two fixed broadband subscriptions per 100 inhabitants.[34] By these estimates, it appears that the broadcast media and SMS learning solutions are the most reliable technologies for a large number of students to access learning. Addressing the importance of offline learning solutions is therefore important to consider in order to continue to close the education gap and address one of the biggest education obstacles in the country.

2.4 Development of formal education

Tanzania's **5-year Education Sector Plan (ESP)** was set in 2016 for a five-year period.[35]

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[28] Central Intelligence Agency, 2020.

[29] The World Bank, 2019b.

[30] Villa, 2019.

[31] Unicef, n.d.

[32] Asante Sana for Education, 2014.

[33] Central Intelligence Agency, 2020.

[34] Central Intelligence Agency, 2020.

[35] Global Partnership for Education, 2019.

The new ESP highlights two key policy initiatives:

1) commitment to providing free and compulsory basic education for the whole population. This inclusive **Fee-free Basic Education Policy** aims to ensure access to education for all;

2) with the aim of becoming a **semi-industrialized middle income country by 2025**, Tanzania is expanding the technical and vocational training and education.[36]

With these initiatives, Tanzania aims to provide its citizens with skills that are needed in the industries in the twenty-first century. The Fee-free Basic Education Policy was introduced in late 2015 with the aim to provide free basic education for all students from pre-primary up to lower secondary school level.[37] The success of the Fee-free Basic Education Policy can be seen in the increased enrolment in basic education, and the decreased number of out-of-school children.[38] In 2013, school student retention was eight years for both male and female.[39] However, as the impact of the Fee-free Basic Education Policy, enrolment in Tanzanian primary education rose by 17 percent and in the secondary education the enrolment rose by 23 percent, over four years in 2015-2018.[40] Moreover, student retention increased with 39 percent in primary school between 2016-2018, as well as a four percent increase in student transitioning to lower secondary. The gender gap has narrowed in primary and lower secondary education; however, the enrolment of girls in upper secondary education remains at 38 percent.[41] Even though overall enrolment in schools has improved, there are still severe gaps between poor and non-poor children, especially comparing rural and urban areas. In 2018, lower secondary education net enrolment in rural areas was only 26 percent, while it was 50 percent in urban areas. The lower secondary school enrolment was 25 percent for poor children compared to 38 percent for non-poor children, showing that there are still gaps in the accessibility for education, even though improvement has happened.[42]

The Fee-free Basic Education Policy is an important way to strive for improvement in accordance with the UN Sustainable Development Goals, which support inclusive education and learning opportunities for all.[43] In Tanzania, there is a nation-wide commitment towards improving education according to the UN SDGs.[44] Thus, the Fee-free Basic Education Policy has been an essential part in the work needed towards addressing several education obstacles for a large part of the population.

The sustainable development goals on education include the goal of providing

[36] Global Partnership for Education, n.d.
[37] The World Bank, 2017.
[38] Global Partnership for Education, n.d.
[39] Central Intelligence Agency, 2020.
[40] The World Bank, 2019b.
[41] The World Bank, 2019b.
[42] World Bank Group, 2020b.
[43] United Nations, 2019a.
[44] United Nations, 2019b.

equitable, quality education,[45] and there are partnerships among the government, non-state partners, and development partners working towards this goal.[46] The **Tanzania Secondary Education Quality Improvement Program (SEQUIP)** aims to provide more accessible secondary education to children in Tanzania and build the country's human capital with essential skills. The project is specifically aiming to help decrease school drop-outs in the secondary education phase, which is especially critical for girls.[47]

However, there are still several challenges pertaining to resources and quality of education. It was estimated in 2019 that there was a shortage of 80,000 teachers in Tanzanian government schools, with shortage in primary schools at 66,000 and secondary schools at 14,000.[48] Overall, there are extreme disparities between the resources available for private and public schools. For example the pupil-to-teacher ratio in public pre-primary school is at 169:1 compared to 24:1 in private schools.[49] Thus, it is a challenge to increase school access at the same time with the aim to improve education quality and learning outcomes.[50] However, the World Bank, together with development associations, has been working with the government of Tanzania on the implementation of the policy to respond to the entry of a vast number of new students in primary and secondary schools.[51]

Structure of the education system

Pre-primary, primary and secondary school in Tanzania usually last for twelve to thirteen years, and depending on the learning pace of a student and whether they pass their exams in different levels, they can proceed to vocational or university level studies. The educational system structure in Tanzania operates approximately on a 2-7-4-2-3+ system.[52] The education structure is as follows:

- 2 years of pre-primary school

- 7 years of primary school

- 4 years of lower secondary school for ordinary level secondary education

- 2 years of upper secondary school for advanced level secondary education

- vocational education or university level studies for 3 or more years.[53]

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[45] United Nations, 2019a.
[46] United Nations, 2019b.
[47] The World Bank 2020b.
[48] Malanga, A., 2019.
[49] Unicef, n.d.
[50] Global Partnership for Education, n.d.
[51] The World Bank, 2017.
[52] Asante Sana for Education, 2014; Scholaro, n.d.
[53] Asante Sana for Education, 2014; Scholaro, n.d.

3. Digital Education in Tanzania

3.1 Digital literacy initiatives in the Tanzanian education system

Tanzania has developed an **Information and Communication Technology (ICT) Policy** for Basic Education, which includes integrating technology in pre-school, primary, and secondary education. The Policy is also included in teacher education and adult education. In private schools in the urban areas, ICT technology is widely used. However, in many public schools, the technology has been used more for administrative purposes, than for students, often because of lack of resources. Basic IT skills are being taught in schools in urban areas, however, in most cases use of ICT technology has not been integrated as a method of instruction.[54]

In Tanzania, the government has made several initiatives in ICT utilization in the education sector, which are aimed to improve the students' digital capabilities. Many of these initiatives have also been supported by international institutes and agencies.[55] An example is the launch of the **African Digital Schools Initiative (ADSI)** programme in Tanzania in 2017. The initiative was set to run for 3 years with an aim at developing secondary schools into Digital Schools of Distinction (DSD). The programme has been focused on 40 secondary schools in the two regions of Pwani and Morogoro, having reached 1,200 teachers and 40,000 students of STEM, the Science, Technology, Engineering and Mathematics concepts, and other subjects.[56]

3.2 Digital education technology solutions in Tanzania

Currently, there are digital learning solutions and services in Tanzania which address learning from pre-primary, through primary and secondary education to education targeted to adults or professional development. The learning solutions range from free of charge use to low-cost or subscription based. Moreover, there are solutions for individual students, but also solutions that are targeted to be purchased by schools. The variety of solutions currently available aim to address the gaps in skills and access to learning, as there are both online and offline platforms available, as well as face-to-face hubs to learn hands-on skills. There are also solutions that can be used with television or radio, where no mobile phone is needed.

Some solutions provide offline resources for students by texting with a mobile phone. The service works with SMS, enabling the delivery of learning content to those with no internet connection. Telecommunication companies have worked in collaboration with many digital education solution providers listed in Table 1. For example, Tigo has launched an SMS platform for educational learning content for students together with Shule Direct,[57] and donated computers and free internet for

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54 Nyirenda M., 2013.
55 Nyirenda, M. 2013.
56 GESCI, 2017.
57 Tigo, n.d.

the use of school students.[58] Also Vodacom has provided access to digital learning programmes through their vast network coverage[59] and with their Instant Schools programme.[60]

Moreover, education for adults and professional training is provided as digital storytelling through media, webinars, and online platforms.

In addition to the digital learning solutions shown in table 1 below, there are several hubs and innovation events operated in Tanzania, or in the close areas in East Africa. These are for example:

- AfriLabs (technology hub network)

- Injini (EdTech incubator)

- Tanzania Innovation Week (event)

- TechFest Tanzania (event)

- Sahara sparks (event)

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[58] Tigo, 2019.

[59] AllAfrica, 2020.

[60] Vodacom, n.d.

	Social Enterprise/ NGO/ Startup	Digital Education solutions: Equipment/platforms/ Content	Product type	Website address/other	Target demographic	Content based on academic curriculum	Scale	Staff/team (estimate)	Charge for users
1.	**Elimu Tanzania**	Platform of educational **material and content** for preparation for **national exams**	Online platform	http://elimutanzania.com	Secondary school students	Yes	Across Tanzania, 2,000 users per month (2017).	10	Free of charge
2.	**Haki Elimu**	Organization promoting right to education for all and **tackling challenges** regarding education.	Empowering people to transform education by movements and campaigns e.g. on social media, TV, radio.	http://www.hakielimu.or.tz/	Concerned individuals and organizations		40,000+ volunteers, 127 schools	40+ staff	
3.	**Mtabe App**	A **chat-based search engine** delivering answers to students' questions.	- Online smartphone learning - Offline SMS learning	https://mtabeapp.com https://www.linkedin.com/company/mtabe/about/	Secondary school students	Yes	Used across Tanzania	10	low cost
4.	**Ona Stories**	**Digital storytelling and media training** utilizing AR and VR technology. Helping	Mobile-first digital platforms	https://www.onastories.com	Professionals/ adults		Clients across Tanzania	10	Based on subscription.

		people grow their businesses.							
5.	**Shule Direct**	**Local, accessible, digitized learning content** for individual students and teachers as well as schools.	- Web portal (online & offline) - mobile applications - Offline SMS services	http://www.shuledirect.org	- All secondary school students. - Ndoto innovation hub targeted for young women.	Yes. Content created together with qualified teachers.	2 million users	15+ staff	Free of charge content. Additional content on a subscription basis.
6.	**Smartcore Enterprise Limited**	"Interactive & local relevant **multimedia learning content**"	- Online platforms - Offline content on DVD/USB	https://smartcore.co.tz	- Secondary schools - Universities	Yes	22,000 users	10	
7.	**Robotech Labs**	Providing **space, guidance and tools** to learn, **build robots and do programming.**	- Introduction to the product: "Welcome to Robotech Labs" (2018) https://www.youtube.com/watch?v=AG2rAgmOQGA	https://robotech.co.tz	From young school kids to students in higher education levels	STEM curriculum in the field of robotics education		10	

#	Name								
8.	**Ubongo**	**"fun, localised and multi-platform educational content** that helps kids learn"	- Accessible technologies: Broadcast media (TV shows, e.g. cartoons, and radio) - mobile phones - online platforms	https://www.ubongo.org	- Families - pre-school - primary school students	Approved locally relevant learning content. Airtime on Tanzania's national network	- 31 countries - 11 million households - daily TV and weekly radio airtime on TBC in Tanzania	60+ staff	Low cost
9.	**World Possible Tanzania**	With Rachel device one can get access to the localized learning content on Rachel.	Rechargeable Rachel device that functions offline.	https://worldpossible.org/tanzania	- Primary and secondary schools	Locally relevant content	Schools across Tanzania	10	Cost for each Rachel device

Table 1: Tanzanian Startups and NGOs providing EdTech solutions: content, platform, equipment, or technology. The information and citations in this table are found from the websites or social media sites of these organizations. See links to these sites in Table 1.

4. NGOs and education programmes in Tanzania

There are altogether twenty-four **Finnish Civil Society Organizations** working in the fields of education and training in Tanzania. The list below is acquired from the website of Fingo.[61]

- Abilis-säätiö sr. »

- Art in Tanzania ry »

- Fida International ry »

- Frikyrklig samverkan FS rf. »

- FSE - Finnish Special Education in Africa ry »

- Globaali sosiaalityö ry »

- Helsingin yliopiston kehitysmaatutkimus

- Hyvinkään Kehitysmaayhdistys r.y. »

- KehyApu Ystävät ry »

- Keravan kehitysmaayhdistys r.y. »

- Kuurojen Lähetys - De Dövas Mission ry »

- Liikunnan Kehitysyhteistyö LiiKe ry »

- Msingin ystävyysseura ry »

- Opettajien Lähetysliitto ry »

- Projektilähetys Mwika ry »

- Ruokkikaa nälkäiset ry »

- Suomen Lähetysseura ry »

- Suomen Pipliaseura ry »

- Suomen Rotarypalvelu ry – Rotary Doctor Bank Finland »

- Suomen Setlementtiliitto ry »

- Suomen YK-liitto ry »

- Suomi-Tansania Seura - Föreningen Finland-Tanzania r.y. »

- Toivala-Säätiö »

- Äetsän Seudun Kehitysmaaseura ry »

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[61] Fingo, n.d.

There are also several **cooperation projects** in education, for example, the Higher Education Institutions Institutional Cooperation Instrument (HEI ICI) programmes that have been running in 2017-2020.[62]

- EARLI
- Geo-ICT
- IRIS
- PBL East Africa.

5. Findings from interviews

The findings section is written on the basis of discussions with representatives of Tanzanian digital learning, or education technology organizations or startups. Altogether nine social enterprises, NGOs, or startups were contacted through email. Interviews were conducted as video calls with five of them. In these conversations, the discussion followed a semi-structured flow with open-ended questions. With all the organizations, the questions were modified to suit the specific organization and their field of operation. The purpose of having a conversation with local actors in the digital education and learning field was to form an overall understanding of how the digital education landscape in Tanzania is currently structured and how they foresee the development of the landscape in future.

There were a few specific patterns that came up in the discussions. These topics are categorized into subsections as demographics, addressing poverty gap, urban and rural areas, public and private education, and the outlook for the future: the response to COVID-19 pandemic.

5.1 Demographics: youthful population

Overall, there are several education obstacles that are causing challenges to education in Tanzania. These obstacles are mostly related to the large and youthful population, which faces a lot of challenges through unequal opportunities. According to the respondents, inequality is caused by gaps in opportunities and access to resources. Students face different kinds of opportunities in education for several different reasons. First of all, as discussed earlier in this paper, about a quarter of the people in Tanzania are living in poverty, meaning that their income falls below the poverty line. Poverty can cause various challenges, for example, children of poor families might have to do work rather than attend school. On a positive note, it seems that the opportunities for education are increasing for girls, together with changing attitudes, which was also noted in the

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[62] Finnish National Agency for Education, n.d.

interviews. Many said that there is a growing number of girls interested in the STEM (Science, Technology, Engineering and Mathematics) programmes as well, as courses and programmes have been increasingly gender-responsive, encouraging girls to participate.

5.2 Addressing the poverty gap

There is a rather newly established, Fee-free Basic Education Policy in Tanzania, which was seen as an improvement by all the interviewees. Some recognized the benefits of the provided lunch during the school day: a lunch consisting of very basic ingredients is provided for students in schools every day. In the discussions, it was seen as an important action towards helping to narrow the gap of students not attending school, as many families would otherwise not be able to provide a lunch at home for their children. Thus, school lunch and the fee-free basic education were generally seen as very important improvements for very poor families. However, many of the respondents noted that even though the basic education is supposed to be free, the families of students have to be able to purchase their required school supplies and uniform which is often an obstacle for many very poor families to send their children to school.

5.3 Urban and rural areas – public and private education

Poverty and the gap between public and private schools is severe, according to the discussions. In private schools, there are considerably more opportunities to learn, as there are more resources available to design the curriculum according to the up-to-date skills. Some of the respondents indicated that they had gone to a private school, and were able to compare that with the available resources of public schools. The digital education in private schools is considerably better, as there is access to devices and skills training, with a lower teacher to student ratio per class. Therefore, more personalized teaching is often more easily available. Many of the respondents said that even if there were some devices in public schools, there might be many situations where the students may lack the skills to use the device or to search for relevant content. Another common problem identified was that even though there were devices, the lack of continuous support available to use the devices is problematic. For example, in cases where the computers had malfunctions and not working properly, devices might stay unused. This was considered as an example of lacking basic IT skills. Poor user skills was also considered as a reason why many students think that there is no relevant or interesting content available; for example, students may not be familiar with the language or accent used in the content they found, leading to misunderstanding and confusion.

In the interviews, also the different opportunities for those living in urban and rural areas were discussed. Even though the respondents said that there are telecommunications companies offering contracts for a lower price in rural areas, the problems might be caused by the geographical challenges making the connections worse. Also, in rural areas, telecommunication connections could be lacking, as well as an absence of internet connections. Also, living in a remote area with only one school in the village, and getting

to school every day is often a challenge with very bad roads and infrastructure. This also speaks to the importance of distance learning with offline and feasible devices that only need electricity to work, for example, television, radio, and mobile phones with SMS learning possibility were identified as very important aspects.

Many of the digital education organizations aim their solutions to be used outside of school, as especially in public schools, there is a shortage of teachers and not enough digital resources and skills training available. According to the discussions, traditional learning methods are utilized instead of digital ones, especially in public schools. Learning outside of classroom by using digital tools to support learning was also seen by some of the interviewees as a way for the students to learn to take more responsibility of their own learning outcomes, thus, personalize the learning experience. Many, however, saw that it is a problem that because of lack of resources, especially in public schools, the digital skills often need to be acquired outside of the classroom.

Many of the interview respondents found that even though the Tanzanian government has implemented initiatives for the utilization of digital technologies in schools more broadly, they are rather hard to realize in practice. The respondents said that especially in public schools, the number of students in each class is far too large, often with only one teacher. Also, the assignments in schools are mostly done with traditional methods, and it might be that in especially remote areas, only the administration of the schools have access to electronic devices and an internet connection. There are several reasons for this, but mostly the problem was seen in the costs and difficulty to afford the hardware and connections financially and geographically; in remote villages the problem usually is that there is no internet connection at all, and perhaps no electricity.

5.4 Current affairs: response to COVID-19 pandemic

All of the interview respondents addressed the situation with COVID-19 in some way. Overall, the situation caused a lot of concern about the operation of their organizations. As the schools have been closed during the pandemic, the number of customers or users and their subscriptions for the products had decreased or ended. The organizations whose products are used in schools, indicated that they were concerned, as schools were closed, and no new subscriptions were made. Also the organizations that had been engaging face-to-face learning with students with digital devices, faced challenges because of the pandemic situation.

However, some of the organizations have been able to continue their operations rather well despite the pandemic. These organizations have operations in areas that are not as directly affected by the restrictions caused by the pandemic situation. Those operations that could be continued were, for example, broadcast media on television or radio, either online or offline messaging platforms on mobile phones, as well as online platforms for independent learning on devices for those who have an appropriate device at home. Therefore, some of the organizations have had resources to respond to the COVID-19 situation quickly.

The respondents' projections about the continuation of the pandemic seemed to be very

long-term, as some of them saw that all businesses and schools might be routinely opened only in the autumn of next year. They especially saw the situation with distance learning or no studying at all as a very big problem for the improvement of digital literacy, as a large number of people in Tanzania do not have internet connection at home or other devices to learn with. Thus, the effects of the pandemic were seen quite challenging and far-reaching. The role of online and offline learning platforms as well as broadcast media were found to be very important learning methods during the pandemic, as distance learning is needed even more than normally.

The need for use of ICT technology has also been recognized in a recent release by the World Bank Group, which says that in order to prevent spread of COVID-19, ICT is relied on more heavily especially during the pandemic.[63] This speaks to the importance of the use of digital learning solutions in education more widely, in order to strengthen capacity and resilience in future and for students to continue learning effectively despite a pandemic or other situation.

6. Recommendations

With this study there can be identified some recommendations for NGOs to use. Regarding the conversations with education technology organizations, there are some gaps and challenges in delivering needed resources for digital learning. These gaps and challenges are important to recognize in order to see what kind of difficulties are faced and what is needed to be planned on how to overcome them when operating locally.

The key gaps and challenges in delivering digital learning solutions in schools were identified as:

1) **Inadequacy or lack of available devices for online and offline environment** and addressing **rural-urban gap**. There are challenges especially related to the electrification and internet connection in rural areas, and therefore, lack of devices especially in public schools in rural areas.

2) Lack of **implementation and continuous IT support for using the devices**.

3) Lack of appropriate **training of digital skills** for teachers as well as a chronic **shortage of teachers**.

4) Shortage or absence of **skills to search for relevant learning content**. It is important that students are able to search for relevant content in the Tanzanian and East African context with the common languages and concepts used.

Based on the background research for this report, as well as the findings from the discussions with local digital education organizations, a few suggestions for aspects to

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[63] World Bank Group, 2020b.

consider could be presented. The following suggestions could be addressed by NGOs with their resources and knowledge about local capacity building. This capacity building can mean, for example:

1) **Collaborations** with various participants by organizing face-to-face trainings or digital meetings remotely, building connections between various relevant parties, and building relationships with different stakeholders. Important stakeholders could be local government representatives, community leaders, families, teachers, local EdTech hubs, startups, and NGOs. To ensure collaborations broadly in the relevant aspect, they could consider;

    1. **devices**: acquiring low cost, offline devices to deliver credible content to a large number of students. Especially in rural areas, basic televisions or radios are more feasible digital learning tools, as online connection is often minor or non-existent.

    2. **training**: trainings of basic digital skills and presenting devices in schools and communities. The training could be targeted to teachers or students directly.

    3. **content**: connecting schools and communities with relevant solutions available by acquiring locally relevant and feasible content from digital education content creation NGOs or startups.

2) **Raising awareness** in the communities about digital tools and opportunities available for students; for example, raising awareness about participation and learning opportunities with the organized digital learning activities of local NGOs, startups, or hubs.

7. Conclusion

According to the findings and recommendations of this study, it seems that the major goal in the development of digital education in Tanzania would be to work on the inclusive and skills-centred aspects. The gap in quality of education between rural and urban areas, as well as public versus private education is severe, thus, the education of basic digital skills to students inclusively is very important to address, in order to prevent an even larger gap.

In this study, it was found that there are some key education obstacles in Tanzania that need to be addressed in making the digital education more inclusive and effective. These education obstacles related to demographics, poverty, and region, could be addressed by 1) acquiring appropriate devices for both offline and online studying, 2) working on the implementation and support for the end use of devices, and 3) training teachers and students with digital skills, as well as 4) raising awareness on how to access relevant digital learning content for the specific sociocultural context in Tanzania. The key is to provide essential training, skills and support to use the devices that there already are in schools, as well as raise awareness on available learning opportunities for students also outside of

the classroom.

Overall, there are several education obstacles that are causing challenges in education in Tanzania. More challenges are being faced as the youthful population is growing rapidly. In addition, the gap between schools in rural or urban areas and public and private schools is a challenging matter, especially considering the severe shortage of teachers and IT skills education available. The COVID-19 pandemic is making the situation of students and families in vulnerable positions even more challenging as it is affecting the economy widely and the learning possibilities of students in many ways. Therefore, more investing in the Tanzanian digital economy is needed as well as collaboration between the education sector actors to further enhance digital learning and education.

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