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PROGRESS REPORT

Inclusive, equitable quality education is a shared responsibility

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Common Agenda

Position Paper No. 4

Digital learning and transformation

1. Introduction

Action Track 4 discussion Paper (TES, 2022) defines digital learning as a lever to transform teaching and learning by advancing *aspirations for inclusive education based on principles of social and economic justice, equity, and respect for human rights*. The transformative potential of digital technologies to *open new and inclusive avenues for teaching and learning*, enable just in time and open education, assist marginalised learners and streamline time consuming administrative and assessment processes has remained largely elusive in many countries, with many cohorts of learners leaving the education system without having had a digital experience. Despite this, education systems even in technology deprived settings continue to aspire for technology integration and seek possible solutions to the challenges that are stymieing the realisation of digital transformation in education. Challenges that hinder technology integration include pressures on education budgets by what are considered more pressing needs, lack of vision and planning for technology, low demand by teachers and learners, poor infrastructure, lack of teacher capacity to use technology for teaching and lack of private sector investment towards public sector digital hardware and software acquisition and connectivity.

This position paper explores Namibia's challenges and good practice in digital learning and makes proposals for priority actions needed to build on what has already done, to improve digital learning and transform the education system.

2. Challenge

Thematic Track 4 discussion paper on Digital Learning and Transformation, highlights four main challenges to digital learning. Firstly, there is insufficient access to digital technologies and internet connectivity. This challenge predominantly affects people in less developed countries, poor communities, girls and women, exacerbating existing inequalities by widening the digital divide. A third of children and youth globally have no access to the internet at home and millions do not have access to devices; "boys are 1.5 times more likely to have a mobile phone than girls;[1] and in "some countries, internet use is *four times greater* for boys than for girls"[2] and female teachers report a higher level of anxiety with using digital technologies for teaching and they also have a lower perception of their digital competencies compared to male teachers. The gender divide is exacerbated by stereotypical representations of technology use in popular culture and educational content. The digital divide is exposed more clearly in times of crises, when there are other challenges that remove children from the classroom for prolonged periods. For example, COVID -19, ebola and war, further

[1] Phumzile Mlambo-Ngcuka & Anne-Birgitte Albrectsen. 2020. Op-ed: We cannot allow COVID-19 to reinforce the digital gender divide. *UN Women*. https://www.unwomen.org/en/news/stories/2020/5/op-ed-ed-phumzile-covid-19-and-the-digital-gender-divide.

[2] UNICEF. 2021. *What we know about the gender digital divide for girls: A literature review*. https://www.unicef.org/eap/media/8311/file/What we know about the gender digital divide for girls: A literature review.pdf

marginalises learners without access to digital technology at home and increases their learning loss, potentially leading to permanent drop out. Even where technologies are available in the home, female children are expected to prioritise chores even when they must be listening to an educational broadcast for their learning,[3] for example.

Given the under preparedness of countries at the time of COVID-19, the trigger response for most was to institute online learning even when their countries were not prepared for this. Of course, this was an unsuccessful response in many cases. Digital transformation takes place over time, with dedicated investment, and COVID-19 should give countries who were caught unprepared the impetus to develop their digital infrastructures to prepare for and cope with future education emergencies. Predictions that education emergencies will become a part of life because of climate change.

Secondly, limited digital competencies are a significant barrier to effective use of digital technologies regardless of a country's development status. Recent data from ITU indicates that a third of people globally "lack the basic digital skills needed to put electronic files in folders and use simple copy-paste functionality".[4] Lack of digital skills is insurmountable in countries where citizens can get by without needing these skills to access services, but they are likely to be overcome in countries where services, even government services have been digitized to make life simpler for citizens, for example avoiding queues to pay municipal bills, for banking, or for voting. The COVID-19 pandemic also exposed the need for access to digital devices and connectivity not only for education but also for essential daily tasks like shopping and access to medical care. This suggests that developments in digital technologies in schools cannot be separated from life. Digital technology development should be country wide, leaving no one behind so that uptake is ubiquitous, and technology becomes a way of life. This will automatically remove other barriers of access and finance as the normality of digital technologies would mean they are available to everyone.

Thirdly, the cost of investing in digital technologies is prohibitive for most governments who simply do not have the financial means to invest in digital educational technologies. While there has been recourse in some countries in accessing private sector funding to realise provision of digital technologies in schools, in other countries, the tensions between most governments and private sector investment in education and the pushback by teacher unions particularly in relation to the private sector benefiting from education which is perceived to be a public good, has stifled the growth of public private partnerships (PPP) in expanding access to digital technologies. Even where PPP are possible, there are prominent challenges in setting them up in the education sector:

- Low level of capacity for implementing PPPs.
- Difficulties in setting up frameworks that hold non-state providers accountable in measures that affect school outcomes.
- Cost of contracting the private sector is usually high and this can affect, in particular, huge projects that the public sector plans.
- Education is seen as a non-commercial activity by the public sector, whereas the private sector there is concern that policy reversals may reduce the benefits arising from arrangements made from these partnerships.
- Partners usually have different aims, constituencies and ways of working. Good partnerships require equal and continuous communication between partners.

[3] See interview observation by an education official in Rajasthan, India in Mawoyo et al, Innovative financing for the public education sector, 2021

[4] TES 2022 Action track 4 discussion paper

- The power that each partner holds also affects the agreement on starting partnerships. In most cases the government always wants to take the role of being a performer in these partnerships. (Latham, 2009; Liu and Yamamoto, 2009).

Lastly, in most developing countries, the lack of basic infrastructure like roads to get to schools and electricity (Kamutuezu et al, 2021) which in some countries will take decades to address are impediments to digital infrastructure development. Many African countries experience these basic infrastructure challenges and they are mostly crippling any successful efforts at technology integration.

3. International good practice

Despite the apparent challenges that stymie the uptake of digital technologies, some exemplary undertakings abound, some small scale, working with a few schools and others large scale, working with many schools, using low-cost digital technologies to improve the teaching and learning experience.

To address the digital divide, multipronged approaches are required because in some countries the gaps are very wide. In India, the government is working with civil society organisations and the private sector to bridge the digital divide especially between rural and urban schools. An exemplary intervention is the S M Sehgal Foundation intervention, *Transform Lives one school at a time,* whose transformative agenda includes constructing smart classrooms and equipping them with a smart TV "that can be connected to any android smartphone through screen mirroring" which can be used by teachers to show audio-visual educational content to learners for an interactive and immersive learning experience. The Foundation is working with 92 rural schools.[5] In Ireland, in an example of how the private sector can contribute to reducing the digital divide, Microsoft's *STEM Passport for Inclusion* programme is supporting 1 000 girls in 45 schools with access to technology and improving their digital proficiency to increase the number of girls from disadvantaged backgrounds studying science, technology, engineering and maths (STEM) programmes at university to enter into digital careers[6]. This initiative is part of a suite of Microsoft Ireland digital interventions to the value of €500 000, with an additional €450,000 provided as part of the *Rethink Ireland Education Innovation Fund Awards*. One of the interventions focuses on teacher education, where the Microsoft Dream Space team would deliver a STEM-based module to student teachers in Maynooth University's School of Education on how to deliver enhanced STEM lessons while on placement in the participating *Digital Wealth* schools.

The One Laptop Per Child (OLPC) project is one of the projects that has reached many corners of the world, implemented over the last 17 years in more than 64 countries, distributing over 3 million educational laptops. Without going into the merits or demerits of the OLPC, the intervention stimulates the imagination about what is possible operationally to reach large numbers of children and bridge the digital divide. A project like OLPC bursts with replication possibilities and can be implemented more widely, using lessons learned from the OLPC roll out, especially in countries like Peru, with 980 000 laptops distributed, Rwanda where over 213 000 laptops were distributed and

[5] Seghal Foundation. (2021). Addressing the digital divide in education: Tackling rural accessibility.

[6] Gallagher, M. (2022). Maynooth and Microsoft Launch Programme to Address Digital Divide. *The University Times*. Available at: https://universitytimes.ie/2022/01/maynooth-and-microsoft-launch-programme-to-address-digital-divide/

Uruguay that had 702 000 laptops[7]. These countries can provide useful lessons of impact based on large sample sizes.

Considering lack of digital competencies, the interventions mentioned above, as do many digital integration programmes, include a teacher training component. Further, structured guidance on developing the required competencies for teaching with digital technologies from primary school to tertiary level is provided in the UNESCO ICT Competency Framework for Teachers, which can be utilised for both in-service and pre-service teacher professional development.[8]

Regarding financing issues, Switzerland and South Africa have engaged in effective PPPs for education digital technologies. The Swiss Conference of Cantonal Ministers came up with a program that was aimed at improving computing facilities and internet connections at schools. Companies such as Apple, Cisco and Dell which were involved in the partnership, provided all the required hardware to the schools at lower prices. For a fast and reliable internet connection, Swisscom, a major telecommunications provider, offered free broadband internet connection and also provided tech support and web content filtering to the schools. To improve teacher training, the private sector was not involved, and it became solely the federal government's responsibility. This was also regarded as the central element in the introduction of ICT in education. At the end of 2007, the program had managed to provide computer equipment to 99% of the schools with a ratio of 1 computer to 7.6 students and provide internet to 95% of the schools (Petko, 2009).

In South Africa, several technology integrating learning interventions have utilised PPPs to achieve their goals. The *Khanya* project in the Western Cape was a joint venture between the Western Cape Provincial Government and its local communities. The core funding was provided by the Western Cape with the local communities providing 20% of all costs. *GautengOnline* involved partnership between the Gauteng Department of Education and private companies like Cloudseed, KPMG, Ernst and Young and Huawei. These partnerships were to design, build and run end-to-end solutions in order to have an efficient ICT integration (Isaacs, 2007; www.gov.za). The most recent project, *Operation Phakisa,* involved five workstreams that were Connectivity, Devices, Teacher Professional Development, Digital Content Development and Distribution and e-Administration (Kwet, 2017).

While government is expected to address the digital divide and improve the quality of education at no fee paying schools, efforts to find solutions to low education outcomes in the public education system for parents who can afford to pay small fees to improve the education of their children are under way. Some organisations are responding to the poor quality of public education despite huge investments of fiscal funding in these systems through the incubation of affordable '*Edtech*' solutions to address teaching and learning challenges and improve learning, while providing solutions that bridge the digital divide. One such initiative is the Injini Africa's EdTech Incubator programme, which draws entrepreneurs with products at minimum viable product (MVP) stage to an intensive incubation programme that exposes the young entrepreneurs to successful entrepreneurs and funders who can help them grow their businesses. One of the Injini projects that demonstrates the affordability of the products developed, and the development of these products using sound pedagogic principles, is the M-Shule initiative which addresses the challenge of lack of differentiation of learner abilities by teachers in the classroom. The initiative makes use of an adaptive learning engine to measure learning levels of each learner to deliver supplementary content that matches that child's learning level. Learning aimed at supplementing what is taught in schools and a dashboard for parents and teachers

[7] OLPC. Where it all began: https://laptop.org/aboutolpc/

1. [8] UNESCO ICT Competency Framework for Teachers: https://www.unesco.org/en/communication-information/digital-competencies-skills/ict-cft

to monitor learners' progress are also provided. M-Shule uses feature phones and SMS (JET Education Services, 2019), so many learners without smart phones are able to utilise this service.

Regarding lack of basic infrastructure, many African countries have embarked on rural electrification programmes, mainly to improve the economic outlook of rural areas by linking them to cities where they can market their farm produce, and improve the quality of life of citizens in rural areas (see for example the Jamaican Rural Electrification Programme[9] and the Malawi Rural electrification programme[10]). These electrification programmes are enablers to digital technologies in the classroom as communities and schools become e-ready because of this infrastructure.

In summary, the barriers to technology integration in schools have provided an evidence base to enable innovative solutions. The following have been done to address some of these challenges:

- Incubation of affordable technology solutions to provide alternative edtech solutions to working class parents.
- Promoting 'bring your own device' interventions to increase the number of devices in the class.
- Public private partnerships are being used to finance edtech solutions.
- Coordinated approaches to infrastructure deployment are cost effective and efficient.
- Open-source platforms are being used to access free content and platforms for use by schools.
- Affordable EdTech solutions to poor provision are being developed.

4. Current situation in Namibia

In Namibia, 59 percent of the population has access to the internet and mostly in urban areas with rural communities largely left behind. Many schools in Namibia do not have access to digital technologies. For example, only 31 percent of schools are utilizing SchoolLink for administrative purposes and 77 percent do not have access to digital and assistive technologies.

Access to digital technology and connectivity and the provision of inclusive assistive technology is crucial to narrow the digital divide and contribute to achieving Sustainable Development Goal 4 (SDG4) by 2030 and Namibia's Vision 2030. Namibia is committed to providing these incrementally.

5. Reflections from the Regional Stakeholder Consultations

The challenges listed below were solicited from 14 regional consultations.

Access to devices and connectivity

The challenges of digital technology and connectivity access due to COVID -19 were acknowledged by stakeholders. Further, it was stated that:

[9]Jamaica Social Investment Fund: https://www.jsif.org/content/rural-electrification-programme-rep#:~:text=The%20Rural%20Electrification%20Programme%20%28REP%29%20aims%20to%20extend,and%20provide%20better%20quality%20life%20in%20rural%20communities.

[10] Malawi rural electrification programme: https://www.energy.gov.mw/service/malawi-rural-electrification-programme/

- Access challenges are differentiated by geography; it was reported that in rural areas, some lack of devices stem from lack of basic infrastructure like electricity, which needs to be addressed before any aspiration for technological access can be realised.
- Some rural schools do not have technologies and connectivity in comparison to their counterparts in urban areas, even where there is electricity.
- A key access challenge stems from practices in some schools, where according to youth inputs from the consultation sessions, learners are not allowed to use computers even when they have computers in the school. Learners indicated that this is a huge challenge for them as they do not have smart phones and therefore if they do not access the internet at school they are completely disadvantaged as they can neither access the internet nor acquire digital skills that are essential for the modern workplace. Youth expressed concern that they leave school without having been exposed to digital technologies. The lack of personal devices caused learning loss during COVID-19 as learners could not be reached and had no access to learning resources in situations where teachers had not prepared any hard copies of learning materials.
- It is concerning that teaching Information Communication (IC) as a subject without any computers is common practice which is done because of lack of computers. It was reported that "A teacher taught 22 classes IC without a single computer by relying on the learners' experience". This raises a question about quality standards although this was not raised as a challenge. The concern is why this subject would be offered when there are no resources for the effective teaching of the programme. Cohorts of learners go through the system and are regarded as having done IC in school without doing the practical component, which is a serious concern. It was reported that in many places there are no qualified IC teachers, and so IC is not taken seriously as a subject.
- Some access challenges are self-imposed. It appears many schools have a no gadget policy, which means that learners cannot use their own devices at school. This is self-defeating as learners' own devices could be used for the practical component of IC that are being taught without devices. This also affects learners with disabilities as it was reported that they experienced a shortage of assistive devices. Some of the computers and software in schools is reportedly abandoned because it was obsolete. There are no budgets to refresh and maintain devices. Exclusionary practices in access to computers also restrict access to devices – it was reported that not all learners are allowed to use computers in some schools as only teachers or learners doing computer studies can use computers.
- All the challenges highlighted here could be exacerbated by a lack of monitoring to check on state of resources and their use, which leads to a decline in both the state of equipment and teaching practice.

Teacher lack of skills

- Youth believe that teachers as digital immigrants are hindering the use of computers in schools. They expressed concern that "teachers are not developing with time".
- Lack of teacher capacity was linked to lack of focus on ICT integration at initial teacher education and during in-service training.
- It was reported that the ICDL course that used to be provided to teachers had been discontinued, and while it was still being offered, not all teachers had been trained. Besides capacitating skills and knowledge, this course was lauded for providing teachers with laptops, but because not all teachers received this training, not all teachers have devices. To support in-service teacher development for ICT integration, a cascade model was adopted, which was reported as ineffective because the master trainers failed to train others.

Lack of basic infrastructure

- Lack of electricity particularly in rural areas hinders technology deployment. However, this observation did not consider that load shedding can frustrate even those with electricity, and that alternative sources of energy, i.e. solar and wind energy, may be more viable for rural settings and in the long term may be more affordable than electricity from the grid.
- IT equipment is becoming outdated and obsolete and insufficient with no replacement plan in place.
- Lack of IT support (e.g. only one IT technician in a region with over 270 schools).

Lack of digital content

- It was reported that there is a lack of digital content for teachers and learners, including for learners with disabilities. Further, there are very few sustainable agreements with partner institutions (National Broadcast -radio and TV) public institutions (OneAfrica) and Community Radio Stations for the offering of affordable services to provide digital learning resources. Pedagogically sound and well-designed content can support learning effectively.

6. Namibian good practice

Despite the challenges highlighted some examples of good practice were also noted, including the fact that Namibia has an ICT policy. However, this policy does not seem to be universally known as some stakeholders reported that the country needs an ICT policy.

In one region, it was reported that 90% of the schools are connected to the internet and are using EMIS, although the internet was reported to be very slow. Some schools have free internet and there seems to be a high prevalence of state-of-the-art libraries with ICTs accessible to learners. It was reported that there are open education resources (OER) available, and that some teachers have the capability for digital content development, and during the COVID-19 pandemic, these teachers developed digital content. These school-level initiatives were supplemented by the Ministry of Education, Arts and Culture, which worked with the national radio station to transmit regular educational radio programmes aimed at higher grades. These address specific elements of the curriculum in an accessible way. Each insert ended with questions for the listeners to engage with. These programmes have carried on after the end of the pandemic.

Learners are using multiple means to access digital content, e.g. YouTube videos and Google for researching topics. In addition, some schools were very innovative during COVID-19, using digital and print media to get content to learners and keep on teaching e.g. Communicating through Google classroom where possible and providing learners with data.

The Ministry of Education, Arts and Culture has prioritised the provision of assistive devices and technologies for learners with disabilities. In addition, the private sector has drastically contributed to financing the education sector through the procurement of digital technology in schools and training teachers on their use.

7. Proposed transforming levers

A multipronged approach is required to achieve digital transformation in the education sector in Namibia:

Policy

Enabling policies to promote different modalities of device use, e.g. 'bring your own device' will increase access to and use of devices, which is better than current practice where IC is being taught without devices. IC itself is often taught by unqualified teachers and the policy on post provisioning norms needs to be revised to increase IC staff and technical support personnel in regions.

Funding

Budgets are needed both in schools and at national level for purchasing technologies, maintenance and repair. At school level, technology budgets will provide schools an opportunity to make their own technology choices and purchases, as well as replenish and maintain their ICTs. At national level, an ICT budget will enable continuous roll out of ICTs to resource all schools, and also to replace outdated equipment and for maintenance. With the education budget already being said to be insufficient for other key operational costs, innovative ways of raising funding were proposed, for example from the private sector. Having a sufficient budget can facilitate an incremental approach to achieving universal access which includes acquisition of the most updated technologies for new schools and upgrading technologies at already equipped schools.

Coordinated planning

Stakeholders believe that coordinating between the Ministries of Education and Energy will expedite electrification of schools for technology deployment. System coordination of internet connectivity can also be beneficial so that connectivity planning considers all levels of the system e.g. all schools around universities should be connected using the same provider and infrastructure. Coordinated planning particularly between government departments can facilitate negotiations for cost effective and bulk purchases of devices and internet, and the Telecommunications Ministry would leverage its relationship with the Telecommunication providers to negotiate this.

Planning for the digitisation of the whole country will eventually lead to seamless technology access and competencies and trials in e-government services could be made to move towards a digitised Namibia.

Government must take the lead in negotiating affordable deals for schools from telcom providers and hardware manufacturers and retailers. Bulk buys would lead to purchase advantages from economies of scale.

Capacity building

Initial and in-service training of teachers in ICT integration will eventually lead to cohorts of teachers that are more confident with technology. Ministry officials also need capacitating so that they inspire confidence in their promotion of ICT integration.

The Ministry should reinstate the ICDL programme for teachers and re-introduce it for education officers in regions and Head Office directorates.

Monitoring and evaluation

Setting specific, measurable, achievable, realistic and timebound targets will ensure that there is a budgeted plan for ICT roll out that can be continuously assessed and adjusted. Monitoring use and

condition of equipment is also useful for informing the Ministry what direction to take with ICT roll out. Evaluations are also important to get evidence of what works for replication and scaling, as well as for course correction.

Proposed priority actions

The key actions to achieve transformation in digital learning are:

- Aligning electrification and ICT planning and considering alternative sources of energy like solar and wind which are affordable in the long term, to enable ICT access
- Addressing teacher capacity at initial teacher education level. ICT should be added as a key competency in teacher education programmes
- Developing staff provisioning norms for IC teachers and regional technical support personnel
- Quality assurance of the IC subject to be strengthened
- Providing school budgets for ICTs and monitor the use of these budgets
- Consider innovative financing options for ICT roll out including PPPs
- Amend telecommunications policy to promote contributions by service providers and incentivise those who respond positively
- Promotion of open source platforms and resources
- Develop and implement IT equipment replacement plan and offer adequate IT support.
- Develop digital content that is relevant and friendly to learners with disabilities and ensure availability of assistive technologies accompanied with corresponding training for both teachers and learners
- Institute computer labs for teaching IC and identify a teacher with ICT skills to act as computer lab attendant to assist the learners, including providing assistance in the computer lab after hours
- Reinstate ICT integration skills for education officers on regional and national level
- Government should lead in negotiating bulk purchases for schools to reduce cost of hardware and software
- Digitising some services through e-government may propel e-education.

8. Conclusions

The goal of achieving digital learning and transformation is not only important for improving teaching and learning experiences, but also for preparing learners for a digitalised world of work. Through multi-stakeholder collaboration, contextual constraints can be overcome to enable implementation of digital learning. A concerted effort to increase funding for ICTs rural and under-developed communities should be made. Areas lacking the necessary infrastructure that supports digital learning and transformation should be treated as high priority areas. Areas without electricity connection, internet connection, and access to devices such as computers should be given preferential treatment in government efforts to digitise schools. The government should negotiate bulk deals to improve affordability of devices and connectivity.

The government should invest in human capital to drive the digitalisation process. Training teachers and community members to become digital citizens will ensure that the acquisition of skills is continuous: they will teach learners and act as role models to their children and learners as digital citizens.

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