

WORKING PAPER

The Use of Technology to Promote Equity and Inclusion in Education in North and Northeast Kenya

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Abbreviations and acronyms

ASAL	Arid and semi-arid land
DAA	Digital Attendance Application
EfL	Education for Life
KBTA	Kilimanjaro Blind Trust Africa
KEC	Kenya Education Cloud
NEMIS	National Education Management System
OIRC	Offline Intranet Resource Centre
REREC	Rural Electrification and Renewable Energy Corporation
SDG	Sustainable Development Goal
UDL	Universal design for learning

Executive summary

Kenya has been lauded as having one of the most progressive and effective education systems in Africa. Significant investments in education funding, innovative technology-enabled approaches to improve teaching and learning, and committed leadership make Kenya an example for neighbours and others across the world. However, at a sub-national level, significant variances in education access and quality arise. While many improvements have been made to participation, quality, equity, and inclusion in education in Kenya, there are persistent disparities in access and outcomes for rural learners, girls, learners with disabilities, and other vulnerable populations. The North and Northeastern (N/NE) counties of Kenya are where some of the greatest disparities exist. According to a June 2022 World Bank brief, most counties in Kenya exceed 12 expected years of school. In Arid and Semi-Arid Lands like those in N/NE Kenya, expected years of schooling are as low as 6.5 years ([World Bank, 2022](#)). Very low outcomes are concentrated in a few counties in this region of the country.

Our research examines the context of N/NE Kenya to understand why these disparities exist, and in what ways technology can play a role in increasing equity and inclusion in education in the region. EdTech Hub conducted desk research and spoke with key informants working in equity and inclusion in education to explore these questions.

Some of the greatest barriers to education for learners in N/NE Kenya are:

- **Climate:** Extreme weather conditions and climate-related droughts plague N/NE Kenya. For many communities in this region, especially pastoralists, their lives are inextricably linked to water as it sustains their livestock and is their key source of sustenance and income. Without water, the families must move to sustain their livestock; children then leave school and move with the families, resulting in disruptions to education.
- **Physical and digital infrastructure:** Poor roads, unreliable power, and a lack of schools due to low population density make accessing formal schooling difficult for learners in N/NE Kenya. Additionally, the promise of schools is much less appealing for families who must send their learners long distances to under-resourced schools. Sustainable digital infrastructure is a rarity, as much falls into disrepair due to climate, vandalism, and high costs of maintenance. Digital literacy levels of parents and caregivers are low.

- **Cultural values and practices:** In regions with high poverty rates, families prioritise boys' attendance at school over girls'. Fewer girls are enrolled in school due to the high costs required by parents for textbooks, uniforms, contributions for power, and more. Additionally, where poverty is high, girls may be pulled out of school and married early, so families can benefit from dowries as a source of short-term income.
- **Language and literacy of parents:** The language of instruction is often not the home language in N/NE Kenya. Parents may not understand the school language, creating a barrier between families and school systems. Teachers are often from other regions of Kenya, making it difficult for them to understand the language of local communities and effectively support parental engagement. Additionally, literacy levels of the adults (especially mothers) in the region are low; consequently, there is little support for learning happening at home.
- **Conflict:** Conflicts between tribes in the N/NE are common, with families competing for limited resources. Cross-border conflicts are also common, as neighbouring countries interact with border communities. Terror attacks and insecurity (along the Somali border, especially) have made school attendance and teacher retention challenging.
- **Stigma around disabilities:** Disabilities are not well identified or understood by families in the N/NE region, and many families fear stigmatisation if they have a learner with a disability or chronic illness. These families typically hide learners at home, preventing them from accessing learning opportunities in schools or communities.

The challenges for learners and families in N/NE Kenya are complex and deeply ingrained in the local communities. Technology is part of a suite of tools that can be employed to help address these challenges, along with investments in supportive policies, capacity building for educators and communities, and sustainable approaches to design and co-creation. Some ways in which technology can support the promotion of more equitable and inclusive education in N/NE Kenya are:

- **Increase enrolment, retention, and participation of all learners:** Technology can be used to support messaging to learners and their caregivers through an evidence-based, cost-effective solution to increasing participation in learning. Technology-enabled solutions can also help reduce the cost of school feeding, a large motivator for school participation for families with limited access to food and clean water.

Digital attendance systems can support real-time data collection to inform the design of targeted solutions for marginalised groups.

■ **Identify and support learners with special educational needs:**

Technology can be more intentionally and effectively integrated with the identification and support (educational, psychological, physical, economic, and emotional) of learners with special needs (including vulnerable, out-of-school, hard-to-find learners, and those affected by other factors) in education. Additionally, technology can play a role in building awareness of the opportunities for learners with disabilities through targeted interventions and mass media (especially in local languages).

■ **Increase girls' participation in education:** Interventions incorporating video and open-sourced digital content, TV, and radio to deliver a gender-responsive curriculum, combined with the cultivation of life skills and provision of other resources like dignity kits, have demonstrated value in supporting girls in N/NE Kenya to participate in education.

■ **Curriculum delivery to reach out-of-school learners:** Low-tech interventions like TV, radio, and SMS have shown promising results in reaching out-of-school learners in N/NE Kenya and improving learning outcomes. Technology-enabled learning tools can bolster schooling efforts in refugee camps and provide teachers with resources to differentiate based on the wide spectrum of needs.

■ **Access to safe and inclusive digital content for all learners:** Digital content using local languages can allow learners to fully access learning and bridge the gap between home languages and the language of instruction. Offline access to digital content can ensure that learners in areas with limited connectivity can still benefit from safe and inclusive digital learning.

In conversations with key informants, recommendations on how to use innovative collaboration to develop localised, sustainable solutions for N/NE emerged. These included:

- **Work with climate experts** to honour the deep connection between learning and climate for communities in N/NE, and design solutions that allow for pastoralist families to effectively engage in education.
- **Work with communities and the private sector to improve data collection** and use it to design more targeted, sustainable solutions for marginalised groups. Consider working with the private sector to build

the capacity of state actors and transform institutional practices on the collection, safe storage, and use of data.

- **Empower EdTech entrepreneurs to apply Universal Design for Learning principles to all digital solutions** to make them accessible by all learners. Leverage learner data cultivated through the use of digital learning tools to inform greater inclusivity.
- **Create awareness of the gender biases that teachers, pedagogical leaders and parents / caregivers might inadvertently embody** in the use of technology ([†Tembey et al., 2021](#)). Build the capacity of leaders of learning to ensure equitable access to digital learning for girls and boys.
- **Work with local teachers and community leaders to address stigmas around teaching** in N/NE Kenya and design incentives to bring more high-quality local talent into the teaching profession. Consider positioning the use of technology as a compelling value proposition for new teachers.

1. Introduction

United Nations Sustainable Development (SDG) Goal 4 is a rallying cry for the global education community to improve access, quality, and relevance of education for children, youth, and adults across the world by 2030.

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

SDG 4 is an echo of a conversation begun much earlier in Kenya to ensure an inclusive and equitable education system. Numerous policies and laws aiming to support equity and inclusion have shaped education in Kenya. These include:

- The Kenyan Constitution, 2010
- The Persons with Disabilities Act (2003)
- The National Special Needs Education Policy Framework (2009)
- The Kenya Policy & Guidelines on Alternative Provision of Basic Education and Training (2009)
- The Basic Education Act (2013)
- The Basic Education Regulations (2015)
- The Gender Policy in Education (2015)
- Sector Policy for Learners and Trainees with Disabilities (2018)
- Kenya National Education Sector Strategic Plan 2018–2022
- The ICT in Education and Training Policy (2022).

The Ministry of Education's upcoming Fourth Medium Term Plan also features guidelines, goals, and plans to improve inclusion and equity in education and training.

Despite improvements in equity and inclusion in recent decades, disparities in educational access and attainment persist for girls, learners with disabilities, rural learners, and other vulnerable populations in Kenya. According to the Kenya National Examinations Council's Report on the 2019 Monitoring Of Learners' Progress, Grade 3 girls and learners with disabilities showed lower levels of competence in literacy and numeracy. The Ministry of Education's Kenya Global Partnership for Education (GPE) Compact 2021 ([↑Global](#)

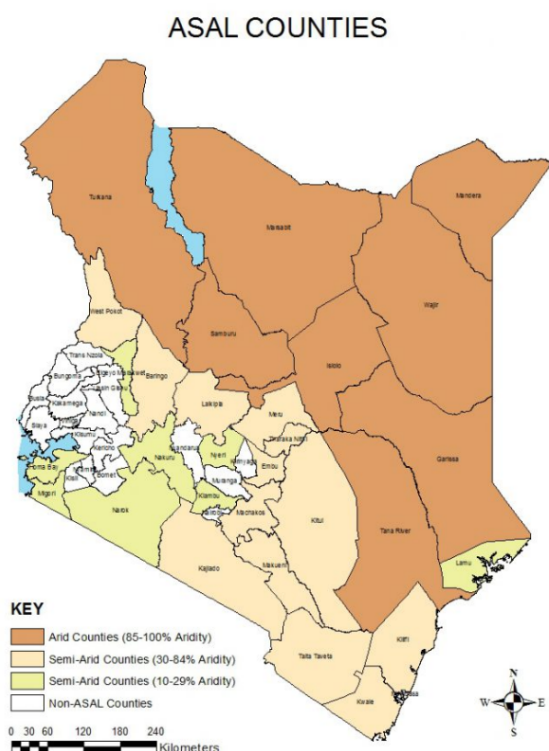
[Partnership for Education, 2021](#): p. 3) also highlighted these gaps, noting that “Realization of gender equality and equity remains a challenge in some regions, with the greatest gaps observed among children with special needs and disabilities.”

There is still much work to be done if Kenya is to achieve SDG4 and its own goals to provide a more inclusive and equitable education system by 2030, the target date for both the SDG’s and Kenya’s Vision 2030 ([Government of Kenya, 2008](#)). Kenya will need to address the regions where disparities are greatest, and leverage all the possible tools and resources at its disposal — including technology — to promote equity and inclusion in education. One of the regions where inequity remains greatest is N/NE Kenya.

1.1. Context and challenges in North and Northeast Kenya

Arid and semi-arid lands (ASALs) make up some of the most vulnerable areas in Kenya. The Kenyan ASALs are spread across 29 counties with different levels of aridity. These ASAL regions have the lowest development indicators in the country ([The Ministry of East African Community, Arid and Semi-Arid Lands, Republic of Kenya, 2022](#)).

Figure 1. Map of Kenya showing ASAL counties



While vulnerable, N/NE Kenya also demonstrates significant potential for Kenya. ASALs cover 89% of the country’s land mass and make up approximately 38% of the population. ASALs are home to more than 90% of the wildlife that supports Kenya’s tourism industry, contributing 12% of the nation’s gross domestic product (GDP). The ASAL regions are home to approximately 70% of the national livestock herd, an estimated value of Ksh 70 billion (approximately USD 570 million), and many counties are also well positioned for cross-border trade. To harness the potential of the ASALs for national growth and individual prosperity, its current citizens and future generations must be empowered with the skills to understand

the complex and interconnected challenges ahead and to work together to innovate and transform the communities around them.

The N/NE region of Kenya comprises arid lands bordering Somalia, Ethiopia, South Sudan, and Uganda. The counties in this region include Turkana, Marsabit, Samburu, Isiolo, Mandera, Wajir, Garissa, and Tana River. These counties (shown in brown in [Figure 1](#) above) make up a significant portion of this high-potential region.

Within this region, however, there are many infrastructural, environmental, and cultural challenges that prohibit children and their families from fully engaging in the education system — the system designed to empower them with the skills and competencies they need for a bright future for themselves and their communities. According to the [World Bank \(2018\)](#), nearly 70% of residents of N/NE Kenya live in poverty and have poor access to basic services.

Physical infrastructure is a challenge in N/NE Kenya, with a lack of roads, water, and electricity creating hardships for families and communities. Poor road infrastructure leads to limited movement of people and goods and a lack of access to social services. With improved infrastructure through initiatives like the North-Eastern Transport Improvement Project, communities will be better connected to the resources they need to stay healthy, access more diverse livelihood options, and more.

Frequent droughts can cause massive disruptions to life in N/NE Kenya due to losses in livestock, the main source of food and income for nearly all residents in this region. The ASAL region has suffered three severe droughts in the last decade, with the most recent drought (2020–2022) being the longest and most extreme. During the recent drought, more than 2.4 million livestock died in Kenya. These environmental and economic disruptions lead to widespread loss of livelihoods and massive displacement of populations, impacting families' abilities to send their children to school. According to an October 2022 report ([ASAL Humanitarian Network, 2022](#)), more than 54,500 children in 17 drought-affected counties were at risk of dropping out of school unless urgent measures were taken to provide them with sufficient food and water.

Electrifying rural communities has been a priority for the Ministry of Energy, Ministry of ICT, ICT Authority, Kenya Power, and Rural Electrification, the Renewable Energy Corporation (REREC), and others in recent years. There have been important initiatives in N/NE Kenya to address reliable power, like the Garissa Solar Plant, the largest grid-connected solar power plant in East & Central Africa ([Rural Electrification and Renewable Energy Corporation, no date](#)). Additionally, supporting the Government of Kenya's Digital Literacy Programme (DLP), REREC and Kenya Power facilitated the electrification of

rural primary schools through both grid extension in schools within grid networks and installation of solar panels in schools in off-grid areas.

Digital infrastructure is also a challenge for N/NE Kenya. According to a 2020 report on the ICT Landscape in Northern Kenya by the organisation Engineering for Change, “Although Kenya is an African leader in ICTs and technology in cities such as Nairobi and Mombasa, the northern region has limited network coverage and where available, is limited to 2G level ([↑Mugendi & Valbuena, 2020](#)).” Low population density in the region has made it difficult for telecommunications companies to make the necessary investments to build the digital infrastructure needed for internet access, especially when the promise of financial returns is minimal. Traditional and digital literacy levels are also low, making digital interventions challenging even when network or connectivity is available. However, the government’s prioritisation of improved connectivity and increased digital literacy skills — as evidenced by the Ministry of ICT, Innovation and Youth Affairs Digital Master Plan 2022–2032 ([↑Republic of Kenya ICT Authority, 2022](#)) and the investments in the National Optical Fiber Backbone Infrastructure (NOFBI) — signal improvements in this area.

1.2. Funding in N/NE Kenya

Although N/NE Kenya still struggles with sustainable solutions, significant public and private investments have been made in this region. According to the National Treasury Public Statement on the Status of Payments to County Governments on 15 September 2022 ([↑Republic of Kenya National Treasury and Planning, 2022](#)), the eight northern counties listed in [Section 1.1](#) above received 18% of the overall disbursements to the country and have some of the highest per-person allocations in the country. The Equalization Fund ([↑Kenya Parliament](#)), established under Article 204 of the Constitution, was designed to address the infrastructure challenges in Northern Kenya and other regions. It provides for the appropriation of one-half per cent of all the revenue collected by the National Government each year and is to be used for improving access to critical services such as roads, water, electricity, and health facilities. However, the fund has suffered significant delays, and the Frontier Counties Development Council (FCDC) and the Pastoralists Parliamentary Group (PPG) have urged for a resolution, so funds are disbursed and used transparently to improve conditions for the region. In response, the Equalization Fund Bill 2022 provides a framework for the direct administration and management of the fund to address the backlog of monies not spent and to provide for the requisite funding in the future. In addition to infrastructure funding, counties receive specific education capitation for mainstream and special needs learners.

Additionally, development partners have injected resources into the local ecosystem for improvements in infrastructure and education. For example, in 2018, with the support of the World Bank, the Government of Kenya launched a USD 1 billion North and Northeastern Development Initiative (NEDI) to enhance investments in sustainable infrastructure and livelihoods in the region ([↑World Bank, 2018](#)). USAID has supported the region through a partnership with the Northern Rangelands Trust, which has included over USD 32 million for holistic development, including education. USAID has also supported the implementation of the Tusome Early Grade Reading programme in public schools in the region, an investment of over USD 67 million for the country as a whole.¹ Given the regional inequality in education outcomes, this area continues to be of interest to development partners.

1.3. Impact of the Covid-19 Pandemic on education in N/NE Kenya

As in most of the world, education inequities in Kenya worsened due to the global pandemic. With schools closed, access to technology-enabled learning was mostly available to Kenya's urban middle and upper classes. Groups that were traditionally left behind, including girls, learners with disabilities, learners in rural and ASAL communities, and other vulnerable groups, suffered most without the support of schools and other social systems. According to a Kenya National Bureau of Statistics survey, the number of children who had not yet reported back to school in the ASAL region in 2021 was more than 1.2 million — nearly a third of school-age children ([↑Guleid, 2021](#)). The impact of Covid-19 was compounded by droughts, conflict, and other challenges, leading to some children being out of school for years. Due to decreased family incomes, many girls in the N/NE region are being lost to early marriages and early motherhood, and boys are being required to tend to livestock and support their families with income generation.

¹ Data on specific monetary allocation to N/NE Kenya not available.

2. Methodology

It is against this backdrop of complex and deeply rooted challenges, as well as high local motivation for a more accessible and equitable system, that EdTech Hub undertook this research. The research aims to better understand the barriers to equity and inclusion in education in N/NE Kenya and highlight the role technology can play in helping to address these challenges.

The Kenyan government, development partners, entrepreneurs, and civil society are all committed to enhancing universal access to education in Kenya. However, there is a need for a more in-depth understanding of the unique barriers faced, and the available existing solutions that can be scaled up to address the challenges outlined in [Section 1](#). Specifically, this research looks to answer this question:

What role can technology play in promoting equity and inclusion in education in N/NE Kenya?

To uncover answers to this question and the sub-questions below, researchers conducted desk research and hosted semi-structured interviews with key informants working on issues of access and inclusion in N/NE Kenya. Key research questions included:

- What are the barriers to primary and secondary school enrolment, retention, and participation in N/NE Kenya? How can technology help address these barriers?
- What is the landscape of support for learners with disabilities in N/NE Kenya? How is technology playing a role, and what more needs to be done?
- What are the barriers to girls' participation in education in N/NE Kenya? How is technology being used to increase girls' participation in education?
- In what way does technology provide alternative modes of curriculum delivery to out-of-school learners?
- What safe and accessible, inclusive digital content is available for all learners?

Researchers reviewed a mix of policy documents, research reports, verified media reports, and other reliable sources to inform the understanding of the context of the region and the topics of equity and inclusion in Kenya. Additionally, researchers spoke with key informants representing special

needs education, persons with disabilities, school feeding projects, gender equity and girls education, and nomadic and pastoralist communities. Semi-structured interviews were conducted, and notes were synthesised to provide insight into the barriers to education, the existing technology-enabled solutions to address equity and inclusion in education and the opportunities that exist for the future. These findings are outlined in [Section 3](#).

2.1. Limitations

Limited education data is available from the N/NE region. This makes understanding the exact scope of learners affected by education challenges in this region difficult. There is also a lack of publicly available data on public- or private-sector-led initiatives to address equity and inclusion in this region. Without this information, it is difficult to ascertain the feasibility or sustainability of these initiatives or the reality of national or county government adoption of private-sector interventions at scale.

Additionally, there was no scope or funding to support interviews with stakeholders on the ground in these regions. Key informant interviews were conducted virtually with individuals representing the local communities, but no in-person interviews or observations were conducted in N/NE Kenya.

3. Findings

Technology is not a panacea for all the challenges to equity and inclusion in education in N/NE Kenya. However, new approaches are needed to more quickly and effectively address the needs of this region. There are promising technology-enabled initiatives both within and outside the region that can be learnt from, and opportunities to scale up these efforts to better serve the region. The following sections outline the ways in which technology can be utilised to address issues of equity and inclusion across five key categories:

1. Increased enrolment, retention, and participation of all learners
2. Identifying and supporting learners with special educational needs
3. Increased girls' participation in education
4. Curriculum delivery to out-of-school learners
5. Access to safe and inclusive digital content for all learners.

These categories represent ways technology can be used to promote inclusion in education and enhance universal access for all learners in Kenya. More details on the barriers for each category and possible solutions are outlined in the sections below.

3.1. Increased enrolment, retention, and participation of all learners

Barriers to learning begin in the early years in N/NE Kenya. Key informants indicated low early years learning engagement in many of the communities. This is mainly due to a lack of resources and / or a lack of awareness about the critical role that early learning can play in educational attainment. These challenges of low enrolment are validated by the Uwezo 7th Learning Assessment Report ([Uwezo, 2021](#)), which found that the seven counties with the highest number of out-of-school learners are from ASAL areas.

Even when learners are enrolled, parental involvement in education is low, as parents see their core responsibilities as paying fees and ensuring learners attend school. For many learners, very little learning happens at home. This is exacerbated by the language barrier between the language used at home and the language of instruction in schools. Parent literacy rates are low even in their primary language, making engagement with school work a far stretch for most families.

Additionally, financial circumstances due to climate challenges, such as droughts and dwindling livelihood options, have an impact on school enrolment and attendance. Gender norms and cultural values for girls' participation in formal learning also impact gender parity levels in schools. In some cases, weather conditions and conflict prevent travel between home and school, as parents opt to ensure children's safety at home.

In some cases, family commitments to Madrasas can also impact school enrolment and attendance, or cause learners to join school late. Families may choose to send learners to Madrasas before joining school, meaning they may join between 5 and 15 years after their peers.

Evidence by the Global Education Evidence Advisory Panel, hosted by the Building Evidence in Education Global Group (BE2), UK Aid and the World Bank ([World Bank et al., 2020](#)), found that providing information to parents and children through messaging on the benefits of education was a cost-effective approach to improve school attendance and learning. In N/NE Kenya, approaches to messaging have shown promise to support shifting parent and caregiver mindsets and engagement in learning. [Keep Kenya Learning](#), a campaign by over 60 organisations serving learners in Kenya, has utilised SMS messages to share information with parents and caregivers on the important role that they play in education and how they can support learning. The resources developed were co-created with several community-based organisations, parent associations and caregivers themselves in communities across Kenya. Turkana-based non-profit [Learning Lions](#)² and parents and caregivers from the local community helped shape the resources, which also included in-person trainings, videos, and offline resources. The Kenya National Examination Council (KNEC), as a part of the Kenya Secondary Education Quality Improvement Project (SEQIP) has also recently released videos to help parents understand the value of education and their role in helping learners navigate the challenges of adolescence and secondary school.

Technology-enabled school feeding can also support greater enrolment, retention, and participation. Kenya-based innovation [Food4Education](#)³ uses smart technology (a smart wristband and mobile money connected to a virtual wallet) to allow parents to easily contribute to nutritious healthy meals for their children. Using technology, Food4Education has leveraged a smart supply chain, operations, and logistics to design a sustainable way to deliver high-quality, nutritious meals. Based on the over 10,000,000 meals delivered, they have found that meals have led to improved nutrition, school attendance, performance, and higher high-school transition rates for learners in Kenya.

² <https://www.learninglions.org/> Retrieved 13 September 2023

³ <https://food4education.org/> Retrieved 13 September 2023

School feeding is a priority under Kenya's new administration, with the [Kenya Kwanza Manifesto](#) calling for additional budget to increase the number of beneficiaries from 2 million to 4 million and conditional grants to county governments to extend the programme and raise the numbers to 8 million in primary and Early Child Development (ECD) schools. Technology can play a role in helping to optimise these investments and make them more sustainable.

In 2018, in partnership with the Ministry of Education and a number of implementing partners through [Operation Come to School](#), UNICEF designed and piloted the Digital Attendance Application (DAA), which tracks student attendance data quickly, safely, and efficiently to support learning and school re-entry, and insight on out-of-school children([UNICEF, 2021](#)). The DAA, developed in partnership with the Computing for Development (C4D) Lab at the University of Nairobi, is now being scaled up and connected to Kenya's National Education Management Information System (NEMIS). This is a web-based data management solution which collects data and information from educational institutions for better, faster decision-making. The digital data the NEMIS collects would allow for a more targeted use of resources for learners who are being left behind and ensure greater attendance and participation for those marginalised groups.⁴

3.2. Identifying and supporting learners with special educational needs

According to [Kenya Disability Resource](#),⁵ inclusion in schools means “creating an environment where children with special educational needs can work, play, and live with children who do not have special educational needs.” According to key informants, the policies are in place to support inclusive learning, but the implementation is lacking. Many learners with special needs are misunderstood, and their participation in formal learning can be limited due to lack of resources, training, and stigmatisation. Informants shared that the situation for learners with special needs in N/NE Kenya is dire, with even more pervasive exclusion from formal learning than in other regions in the country. To address these challenges, technology can be used to support the better identification and support of special educational needs and can transform the

⁴ [Data for decisions](#) — see <https://edtechhub.org/our-topic-areas/data-for-decisions/> is one of EdTech Hub's evidence-based key focus areas, and the Hub is continuing to generate new insights on how technology can be used to enhance data collection, analysis, and planning to improve learning outcomes.

⁵ <http://www.kenyadisabilityresource.org/Special-Educational-Needs> Retrieved 13 September 2023

behaviours and attitudes of the communities that are meant to support these learners.

Through its programme [Ubongo Kids](#),⁶ which is open source and available on local TV channels as well as YouTube, Ubongo raises disability awareness for learners and families in Kenya and beyond. Accessible, localised content that helps dispel myths and build a deeper understanding of the tools and resources available for learners with disabilities and their families.

[Kilimanjaro Blind Trust Africa](#)⁷ (KBTA) is working with visually impaired learners in 39 primary and 18 secondary inclusive and special schools in Wajir, Mandera, Isiolo, Marsabit, and Garissa to better utilise assistive devices to support teaching and learning. KBTA provides a full service along with the digital Braille assistive device called Orbit Reader 20. It also supports the learners with visual impairment in schools and higher learning institutions by providing access to the digital Braille curriculum and other content, user training, repair, maintenance, and provision of spare parts. KBTA empowers teachers through capacity building and improves access to sustainable maintenance solutions through training and facilitation of local IT professionals who can maintain devices.

The Kenya Institute of Curriculum Development's [Kenya Education Cloud](#)⁸ (KEC) has interactive digital content for learners with special needs and can be leveraged to collect more data on the use and effectiveness of inclusive digital content, including content that is being accessed by remote learners outside of schools. However, the size of content on the KEC is relatively large (an average content size of 500 MB), making it difficult to use in low bandwidth areas or on individual data plans. According to recent qualitative research on the Kenyan government's flagship digital learning initiative — the Digital Literacy Programme — most teachers are either unaware of the KEC or not able to access it due to lack of connectivity ([↑Government of Kenya, 2022](#)). This makes it an underused resource for teachers serving learners with disabilities and the learners themselves. If designs for the KEC can be altered to promote more accessibility, then the system could also be leveraged to better understand and improve outcomes for special needs learners in N/NE Kenya.

The EdTech company eKitabu, committed to delivering accessible content for quality education in local languages, has also made strides in serving learners with disabilities in Kakuma and Dadaab refugee camps in N/NE Kenya. Using a holistic approach, in collaboration with local partners, eKitabu has provided access to digital content, assistive devices, and training for learners, teachers,

⁶ <https://www.youtube.com/watch?v=5WjI6QQhBCU> Retrieved 13 September 2023

⁷ <https://www.kilimanjaroblindtrust.org/> Retrieved 13 September 2023

⁸ <https://kec.ac.ke/> Retrieved 13 September 2023

and parents / caregivers in the camps. eKitabu helps build the capacity of educators to use Universal Design for Learning principles in creating more inclusive learning environments for mainstream and special needs learners. In refugee camps, in particular, there is a high turnover of teachers as well as a wide variability in the level of teaching expertise. A structured pedagogical approach supported by technology, like that identified as a “smart buy” by the Global Education Evidence Advisory Panel ([↑World Bank et al., 2020](#)), combined with ongoing support, could help to ensure mainstream refugee learners and those with special needs are accessing a quality education.

3.3. Increased girls’ participation in education

As outlined above, girls in N/NE Kenya face specific challenges to participation in education due to cultural values and practices. In some areas, girls in the arid regions of N/NE, and particularly the Somali border counties, girls account for fewer than 30% of the candidates sitting for secondary exams. Girls’ participation in education may be limited by early marriage or motherhood, both of which have been on the rise since the Covid-19 pandemic. With limited livelihoods due to droughts, some families have resorted to marrying off girls early so as to receive dowries that can provide them with much-needed resources. These girls, unfortunately, are usually pulled from schools to become carers of husbands and families at home. Additionally, teenage pregnancy has caused much concern for the education of girls in Kenya. According to recent data released by the Ministry of Health, one in five adolescents aged 15–19 are already mothers or pregnant with their first child ([↑Maichuhie, 2022](#)). This puts Kenya third worldwide for the number of teenage pregnancies. Sexual and gender-based violence is also impacting girls’ ability to engage in schools. Health Principal Secretary Susan Mochache told Nation Media, “In Kenya, the painful truth is that one out of every three mothers attending an antenatal clinic is an adolescent aged 10–19. We also know that one in three of our adolescents and young girls under the age of 18 have experienced some form of violence, including sexual and gender-based violence ([↑Maichuhie, 2022](#)).” Due to these and other challenges, across the country, but especially in the N/NE region, girls’ participation in education is limited.

The Girls’ Education Challenge (GEC) was launched by UK Aid in 2012 as a 12-year commitment to reach the most marginalised girls in the world. In Kenya, seven projects have been working to empower girls with literacy and numeracy skills and improve transition rates from primary to secondary.

[Discovery Project](#),⁹ led by Impact(Ed) International and implemented in partnership with Avanti Communications, worked with girls in the N/NE counties and employed technology as a part of the suite of holistic interventions designed to support girls' participation in primary and transition to secondary school. This included creating video and open-sourced digital content and a new television and radio life-skills series to develop students' knowledge, attitudes, and skills. The interventions were also intended to shift parent and community norms in support of gender equality and social inclusion.

Girls education and technology is a key focus area for the Hub, and we will continue to generate [evidence](#)¹⁰ on the effectiveness of different modalities to support the teaching and learning of girls through technology.

3.4. Curriculum delivery to out-of-school learners

Learners remain out of school for a variety of reasons, many of which have been highlighted above. However, Kenya's focus predominantly has been on increasing participation in and improving the quality of learning. A silver lining to the tragic Covid-19 pandemic was the refocusing of attention on the need to better serve learners who are prevented from returning to school for whatever reason.

During the pandemic, RTI partnered with SMS-based learning platform M-Shule to replicate the Tusome intervention using offline learning materials and an effective monitoring and evaluation system. The intervention led to a significant increase in children's Annual Status of Education Report (ASER) score of 14.4% for children in the experimental group; there was no significant difference between children in ASAL and non-ASAL counties, demonstrating that geography would no longer be a predictor of success for these learners.

Zizi Afrique's [Jisomee Jitegemee](#)¹¹ leveraged interactive radio programming to reach learners in Turkana county during pandemic-related school closures. The Accelerated Learning Program, based on the Teaching at the Right Level (TaRL) approach, uses simple assessments to identify children's learning levels and create ability-based learning groups. Learners then engage in level-based learning camps, applying the participatory pedagogy and assessing children

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<https://girlseducationchallenge.org/projects/project/discovery-project/#/article/discovery-project> Retrieved 13 September 2023

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<https://docs.google.com/presentation/d/1GmyPCSOq-LjtTqxJJPx4Ub0kSPSszROKI2nULr022lo/edit> Retrieved 13 September 2023

¹¹ <https://hundred.org/en/innovations/jisomee-jitegemee-accelerated-learning-program> Retrieved 13 September 2023

regularly to promote and re-group as they proceed from one level to another. Within 30 days, 76% of learners progress by at least one competency level in literacy and numeracy. During Covid-19-related closures, combining community learning camps and low-tech innovations using SMS and radio-based learning added to the resilience of this approach. Over 4,500 children were reached through community-based camps, and 1,660 solar-powered radios were distributed.

[Education for Life](#)¹² (EfL), implemented by ActionAid through UK Aid's Girls' Education Challenge, establishes and delivers 'catch-up' classes for highly marginalised 10–19-year-olds and out-of-school girls and boys in the counties of Isiolo, Garissa, and others. Through moveable classroom facilities in community spaces and specially trained teacher-mentors near villages, EfL is able to provide learning to adolescents and youth in hard-to-reach areas. Specifically, EfL provides assistive devices and specialised Personal Integrated Therapy for girls with disabilities, which create opportunities for these learners who are otherwise excluded.

3.5. Access to safe and inclusive digital content for all learners

Digital content can be a tool of inclusion or exclusion based on the design used when creating it. For example, the language of instruction in Kenya is English or Swahili. However, most rural and pastoral communities only understand their local mother tongue, which is the primary language at home. With little understanding of either language of formal instruction and a non-local teacher who may not speak their mother tongue, learners struggle to engage fully with the curriculum. Additionally, digital content that is only designed for online contexts further excludes learners who do not have access to consistent, reliable power and connectivity — which is the case for many communities in N/NE Kenya.

Research shows that learners are more likely to enrol and stay in school when taught in their primary language, and their overall learning outcomes are improved ([↑Bah, 2022](#)). In fact, multiple studies have shown that children who are taught in their first language in the early years are more successful at transferring these skills to a second language later. [M-Lugha](#) is an interactive native language learning app that helps both young and adult learners in rural areas of Kenya acquire basic literacy and numeracy with the help of their respective indigenous languages. With a digital solution that works both

¹² <https://girlseducationchallenge.org/projects/project/education-for-life/> Retrieved 13 September 2023

online and offline, learners in ASALs can engage in teacher-led or self-directed learning to help them build their foundational literacy and numeracy skills.

There are promising signs that digital personalised learning can support greater learning outcomes for all learners, including girls and other marginalised learners. EdTech Hub [studies](#)¹³ in partnership with EIDU, M-Shule, Oppia, Nairobi, and Youth Impact are currently generating more local Kenyan evidence on the role of digital personalised learning in improving equity in learning. However, if learners do not have access to sustainable and reliable digital infrastructure — including power and connectivity — then they may lose the opportunity to engage in digital learning. Creating offline access to digital content promotes equity and inclusion for learners, including those in N/NE Kenya. In July 2022, the Ministry of Education, in collaboration with UNESCO, initiated the establishment of a pilot [Offline Intranet Resource Centre](#)¹⁴ (OIRC) in Garissa county, with the goal of providing offline access to a library of digital content ([Elimu Resource Centre, 2022](#)). The OIRC in Garissa High School hosts the server that transmits educational materials to Iftin Primary School (5 km away) using solar-powered mobile nano-stations and local area wireless connections. The long-term vision is that OIRCs in rural centres can support both formal and informal learning in areas with limited or no internet connectivity.

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https://docs.google.com/presentation/d/1nZyJEO6Srrmf2AIVP4TABD2TdT74uiX0Yv_-TIT02pY/edit#slide=id.g107de35e96f_0_0 Retrieved 13 September 2023

¹⁴ <https://newstrends.co.ke/first-offline-intranet-resource-centre-launched-in-kenya/> Retrieved 13 September 2023

4. Innovative collaboration to address persistent challenges

Key informants also recommended that new innovations and approaches should be considered to address the following persistent challenges in N/NE Kenya. These ideas would require more complex, intersectoral collaboration and would require building relationships with diverse stakeholders beyond the traditional education actors. Recommendations made by key informants include:

- **Work with climate experts** to honour the deep connection between learning and climate for communities in the N/NE region and use their expertise to help design sustainable, holistic solutions that allow for pastoralist families to engage more effectively in education. Numerous informants highlighted the disconnect between education approaches and the realities of the impact of climate issues on children and families. These sectors, traditionally operating separately and holding their own bodies of research and wisdom, could be brought together to design innovative approaches to making education more accessible for learners impacted by droughts and other climate events.
- **Work with communities and the private sector to improve data collection** and use it to design more targeted, sustainable solutions for marginalised groups. Lack of reliable data on the realities of equity and inclusion in education in the N/NE regions was cited as one of the greatest challenges to designing sustainable and cost-effective solutions. A new approach, leveraging the capacity of local communities, would provide critical data that would allow for a more profound understanding of the problems and a more holistic and tailored solution that truly meets the needs of local stakeholders. Consider working with the private sector to build the capacity of state actors, and transform institutional practices to better understand what works in a hyperlocal context within the N/NE region.
- **Empower EdTech entrepreneurs to apply Universal Design for Learning principles to all digital solutions** to make them accessible to all learners. Key informants highlighted that the benefits of using universal design for learning (UDL) principles are not just for learners with disabilities. A more inclusive approach creates a more scalable digital product that also ensures an effective user experience for mainstream learners. Raising awareness of UDL principles and the

benefits of this for EdTech entrepreneurs would hold dual benefits for product designers and users alike.

- **Create awareness of the gender biases that teachers, pedagogical leaders, and parents and caregivers might inadvertently embody** in the use of technology in schools and at home. Through parent and learning leader engagement, inherent biases can be surfaced and addressed to ensure girls' access to tech-enabled solutions becomes a reality within the complex N/NE cultures.
- **Work with local teachers and community leaders to address the local stigma around teaching** and design incentives to bring more high-quality local talent into the teaching profession. Consider the upgrading of the teaching profession through the use of technology as a compelling value proposition for new teachers.

5. Conclusion

Technology can play an important role in promoting equity and inclusion in education in marginalised communities like those in N/NE Kenya. Technology can be used to meet learners where they are and promote learning through formal and informal channels. Digital data can inform optimised uses of resources to ensure that all learners are provided with the resources they need to fully engage in learning and that teachers are empowered with the information they need to best support learners and their families. Technology, including analogue technologies like radio and television, as well as digital technologies like SMS and mobile apps, can help transform the behaviours and mindsets of learners and the communities that support them.

More evidence on the effectiveness of these interventions, specifically in the N/NE of Kenya, is needed. There is an opportunity to scale up existing work in the N/NE region to reach more learners and ensure the inclusion of learners with disabilities and other vulnerable populations. There are also opportunities to expand innovations that have been effective in other regions of Kenya to this region, with the support of local communities to adapt them for relevance and sustainability

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