What drives value for money in technology-enabled activities of Girls' Education Challenge projects?
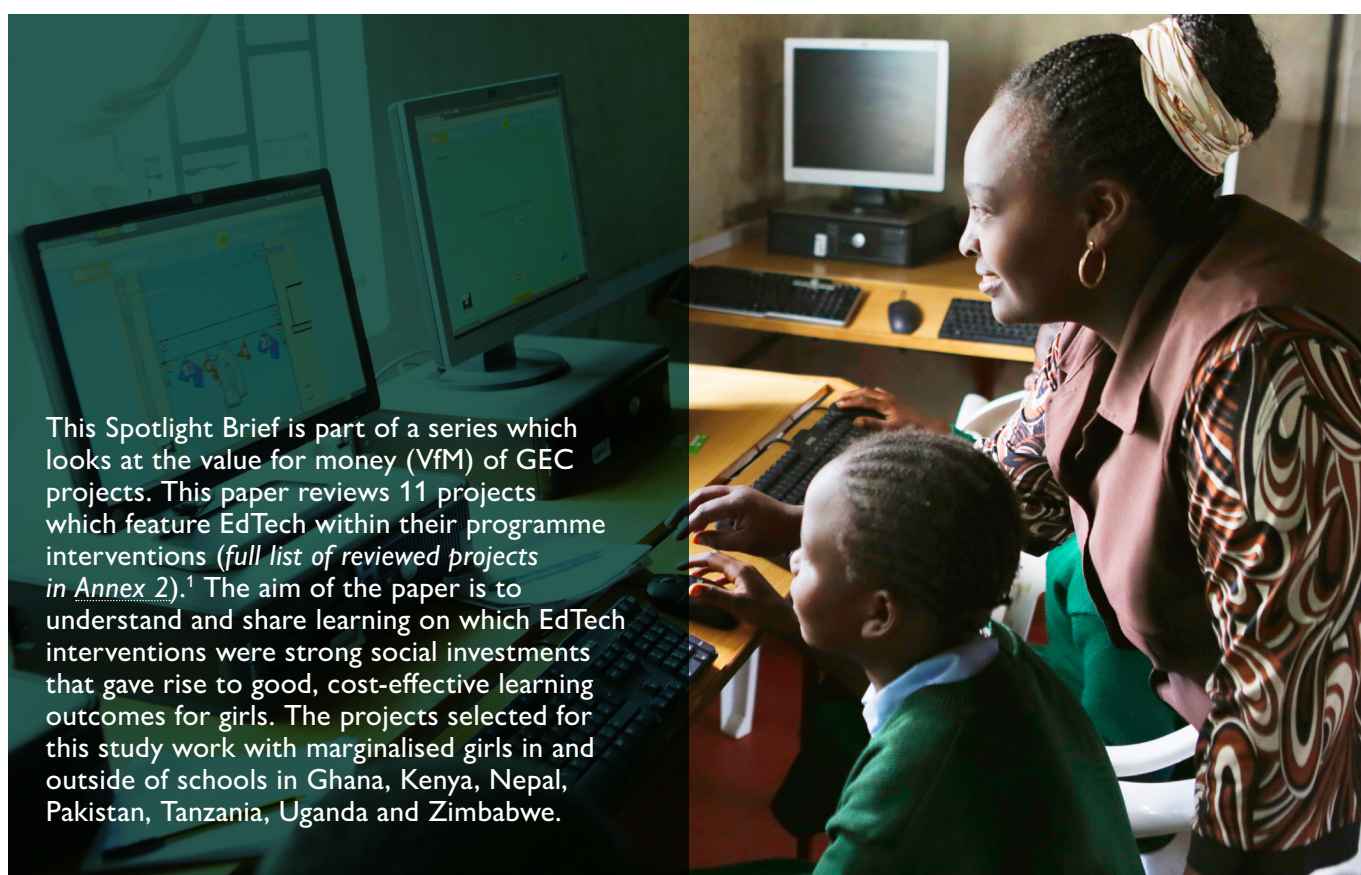
This Spotlight Brief is part of a series which looks at the value for money (VfM) of GEC projects. This paper reviews 11 projects which feature EdTech within their programme interventions (*full list of reviewed projects in Annex 2*).[1] The aim of the paper is to understand and share learning on which EdTech interventions were strong social investments that gave rise to good, cost-effective learning outcomes for girls. The projects selected for this study work with marginalised girls in and outside of schools in Ghana, Kenya, Nepal, Pakistan, Tanzania, Uganda and Zimbabwe.

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The Girls' Education Challenge (GEC) is a £855 million UK aid-funded programme, investing in 41 girls' education projects across 17 low-income countries, and reaching 1.5 million marginalised girls though various formal and non-formal education interventions. Some projects have now completed their activities and others will continue to close over the coming months. Many projects within the GEC's portfolio have used technology (EdTech) within their interventions, whether as a planned component from their inception, or in response to COVID-19 and associated school closures.[2]

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1 The choice of projects was contingent on the use of EdTech and availability of evidence.

2 Girls' Education Challenge. 2021. *Designing and monitoring distance teaching and learning interventions: A guide for projects and implementers*. Accessed 11 Jan 2023. https://girlseducationchallenge.org/media/x1rajoxx/gec_dtl_guide_may-2021.pdf

Key findings

Strong value for money	Promising value for money	Weak value for money
Strong value for money was found in satellite enabled TV for learning and video-based behaviour change content.	Promising value for money was found in digital monitoring, blended distance teaching and learning packages with radio (in hard-to-reach marginalised areas), smart phone-based teacher professional development, software for online content with digital monitoring (where hardware was already provided) and assistive technology for girls with disabilities.	Weak value for money was found in the provision of hardware, satellite enabled internet and tablets alone, if not integrated with other common drivers for success below.

The common drivers of strong value for money within interventions were due to several factors, including context is key, but within that, these interventions show strongest VfM. Otherwise sounds like we're just suggesting investment is best directed into these interventions, regardless of context. external ones such as political buy-in and the presence of a digital policy within government. Other highly relevant factors were projects' ability to: pivot quickly, scale and sustain education technology interventions, reach marginalised communities at a reasonable cost, be flexible in approach and programming and undertake strong needs assessments.

1.Introduction

These projects cover a variety of education-focused activities, such as teacher training, bursaries, income generation, school improvement and government systems strengthening with some type of technological activity. Such activities vary from low-tech interventions such as phone, SMS, WhatsApp, and radio lessons (distance learning), to higher-tech interventions, such as tablets, orbitals,[3] software, desktops, internet and TV. This report aims to inform decisions by donors, governments and policy makers who are planning to implement cost-effective EdTech interventions and policy approaches for marginalised children.

This report is complementary to research by the FCDO funded EdTech Hub. The Hub is further studying the GEC portfolio around the themes of the gender digital divide and gender-sensitive approaches to the use of technology for marginalised girls' education.

Why focus on value for money?

VfM is an important way to think about any education project. It focuses on identifying the best way to use limited resources, which is a key concern for most working in education programmes. VfM is not necessarily about reducing costs, it is about identifying how bigger or better results can be delivered with a given level of resources. If the effectiveness of an activity is reduced because of cost savings, VfM is also reduced. Similarly, while an intervention may be inexpensive, if it does not achieve results, it is not VfM.

The approach and evidence sources used within this review are varied, including project-specific, quasi-experimental evaluations, project monitoring data, expenditure and budget reports, and interviews with the projects and beneficiaries. The measured outcomes within the evaluations are literacy and numeracy (test scores), transition, life skills, participation in schools, and sustainability at the girl, school and community levels. The strength of evidence varies between projects from strongly robust data to more qualitative and subjective data. Annex 2 provides an overview of each project's evidence rating. The VfM framework (*outlined in Box 1*) has been used to conclude on the VfM of the various Edtech interventions.

BOX 1: GEC VALUE FOR MONEY FRAMEWORK

The GEC has a VfM framework, which is applied systematically to draw on evidence from evaluation findings, supplemented by interviews with project staff. Read more about the GEC VfM framework and review methodology in Annex 1. The VfM framework uses four of the Organisation for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) criteria and the National Audit Office 4 E framework:

1. **Relevance** – has the project/intervention invested in the right activities and modalities to respond to the needs and barriers of the girls identified? Has it allocated the right level of resources to them? (*Effectiveness and equity*)
2. **(Cost)-effectiveness** – has the project produced the results it was designed to deliver to the right beneficiaries? Has it produced these results at an optimal cost? (*Effectiveness, equity and economy*)
3. **Efficiency** – Was the project/intervention delivered well? What was the quality of its operations and processes? Was it delivered in a timely manner? (*Efficiency*)
4. **Sustainability** – have the results for girls and others reached by the project continued over time?

BOX 2: VALUE FOR MONEY RATINGS

- **Strong VfM** – project activities efficiently delivered were low cost and with large benefits, which are likely to be sustainable.
- **Promising VfM** – project is on firm ground to offer VfM in the future. Costs may need to be reduced further, or benefits need to be greater or more efficiently delivered in time and sustained.
- **Weak VfM** – project activities were high cost and/or had low level of benefits and sustainability.

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[3] Assistive technology devices to help individuals with visual impairments.

Using expert judgement, the interventions are also rated as strong, promising or weak VfM (*Box 2*). The main limitation of this review is the small sample size of 11 projects and differing strength of evidence for each project.

2. What did the review tell us about the drivers of VfM in Edtech?

The benefits of EdTech

With the plethora of devices available, technology has the potential to provide users with multiple ways of presenting, representing and expressing learning for children to meet their diverse needs. It also has the potential to increase enjoyment and motivation of learners, and an even larger unused potential to support inclusive education of learners with disabilities and for groups who face barriers to accessing education, including those in remote communities. There are many factors that affect investment decisions in EdTech.

EdTech and equity

With two thirds of the world's population of illiterate people being female[4], EdTech can offer an alternative means for girls to access and progress in learning. However, evidence suggests that there is an ongoing significant and complex set of gender digital divides in lower middle-income countries, which are often rooted in cultural gender bias and result in girls having significantly less access to technology compared to boys.[5]

As evidenced in EdTech Hub research, technology can either exacerbate or reduce education inequality for girls depending on the ways in which it is used. When used effectively, technology can be used as a tool to help break down the barriers that stop female students all over the world from accessing and progressing in high-quality education. It has the ability to provide marginalised groups with quick and efficient access to learning in ways that non-technological approaches cannot.

Which contexts drove the successful use of EdTech?

Context is paramount to the success of an EdTech intervention and is mostly out of the control of a project. Projects that operated in countries that have a technology-enabled environment, i.e. the government has a digital policy, schools are well connected through electricity and internet, and/or there is strong political buy-in, were best placed for successful high tech solutions such as smart devices or online content. Conversely, in countries with less of a technology-enabled environment, including limited electricity/internet connectivity and/or inadequate government policy on digitalisation, low-tech solutions such as radio broadcasting and SMS were more successful.

Other contexts were also key. These include the period during the pandemic, school closures or post pandemic. Some projects which implemented technology-based distance, teaching and learning solutions during COVID-19 ended those interventions once schools reopened and resumed face-to-face activities.

Other projects changed the status quo completely and built strong partnerships with local stakeholders, such as local radio stations (to scale and reach wider audiences more efficiently) as a longer-term method of hybrid approaches.

At the household level, for certain interventions, such as distance learning, girls needed access to mobile phones, phone credit, radio signal reach, mobile phone signal, internet connections and/ or the permission of a caregiver to use these items to access learning content. However, these were not always available, especially for very remote communities in marginalised areas. In addition, the attitudes of caregivers towards learning device(s) can also hinder success of the project, especially if caregivers do not have positive perceptions of devices, especially for girls. Broader evidence indicates that girls are less likely than boys to have access to their caregivers' phones for learning.[6] There are also examples from GEC projects in Nepal where caregivers were apprehensive about letting girls use devices to access learning due to the fear of social media dating or elopement. In these cases, complementary interventions that aim to change caregivers' and/or community behaviours perceptions and attitudes towards EdTech are sometimes helpful to break down such barriers.

What guidance can be given to investors of EdTech in low-income settings?

There are two broad types of investments; those in higher-tech contexts with enabling factors for large-scale EdTech rollout, and those within low-tech contexts in which projects can demonstrate and pilot what is possible to achieve with Edtech for marginalised groups or girls.

For the former, the GEC's experience demonstrates that strong political progress towards digitalisation is necessary prior to scaling up. In other words, there needs to be a government strategy on the use of EdTech in schools. It is also necessary to balance investments in the short term, versus viable scale up in the longer term. Cost profiles in similar countries where wide-scale rollout has taken place in the long run offers some guidance,[7] especially if there is clear evidence of economies of scale.[8] Given the proliferation of personal devices around the world (especially mobile phones), digital initiatives are likely to become cheaper in the near future. Within a specific country, a balanced approach might look like making simultaneous investments in low-cost, low-tech initiatives to reach marginalised learners now, as well as more expensive, infrastructural investments for future high-tech planning.

In the short term, with other conditions met, it is often good economics to make high-cost investments, if scale economies and innovation drives down costs in the future. Investors should also consider whether the right mindset and attitudes exist for scaling up EdTech up within the government or private sector. Projects need to be flexible and adaptive given the fast-paced nature of the sector, and there needs to be strong digital monitoring that underpins this. GEC evidence indicates

4 Foreign, Commonwealth and Development Office. 2021. *Policy Paper: Every girl goes to school, stays safe, and learns: five years of global action 2021 to 2026.* 12 May. Accessed 11 Jan 2023. https://www.gov. uk/government/publications/every-girl-goes-to-school-stays-safe-and-learns-5-years-of-global-action-2021-to-2026/every-girl-goes-to-school-stay-safe-and-learns-five-years-of-global-action-2021-to-2026.

5 Barnes, K., Mukankusi, A., Pachitto, J., and Zazai, R. 2022. *Education for Marginalised Girls: Lessons in Implementation from the Girls' Education Challenge.* EdTech Hub. 09 29. Accessed 11 Jan 2023. https://edtechhub.org/2022/09/29/using-technology-to-improve-education-for-marginalised-girls-lessons-in-implementation-from-the-girls-education-challenge/, and EdTech Hub. (n.d.). *Girls and Tech.* Accessed 11 Jan 2023. https://edtechhub.org/our-topic-areas/girls-and-tech/

6 Damani, K., Daltry, R., Jordan, K., Hills, L., and Evans, L. 2022. *EdTech for Ugandan girls: Affordances of different technologies for girls' secondary education during the Covid-19 pandemic.* Development Policy Review, 40 (S2). Accessed 11 Jan 2023. https://doi.org/10.1111/dpr.12619

7 Chuang, R., Burnett, N., Robinson, E. (2021). *Cost-effectiveness and EdTech: Considerations and case studies. (Helpdesk Response 32).* EdTech Hub. Accessed 11 Jan 2023. https://doi.org/10.5281/zenodo.5213890

8 Global Education Monitoring Report Team. 2020. *Global education monitoring report, 2020: Inclusion and education: all means all, Easy to read version, key messages, recommendations.* UNESCO. Accessed 01 11 2023. https://unesdoc.unesco.org/ark:/48223/pf0000373724 and accompanying background paper can be found here: Hersh, M. 2020. *Technology for Inclusion.* UNESCO. Accessed 11 Jan 2023. https://unesdoc.unesco.org/ark:/48223/pf0000373655

that projects that are able to, and are motivated to, proactively respond to changing contexts are much more likely to be successful and offer stronger VfM. The MGCubed and Discovery projects below provide good examples of how to do this. Investors also need to be cautious about introducing technology that becomes quickly obsolete, as this can severely weaken the VfM of the activity/intervention.

For low-tech environments, GEC projects provide some demonstrations of how EdTech can be used cost effectively to bridge the digital divide. It is important for donors to continue to demonstrate, pilot and invest in low-tech contexts, to enable digital catch up for more marginalised children. Even if this may seem more expensive, it is still likely to offer good VfM with equity at the core.

What project processes and designs underpin efficient implementation of EdTech?

GEC projects demonstrate that blended approaches of EdTech and non-tech interventions are necessary for a successful project. Additionally, an ecosystems approach (*Box 3*) of project rollout is also necessary, whereby technology is introduced gradually alongside needs assessments, capacity building and changing mindsets across stakeholders.

BOX 3: DEFINITION – WHAT IS THE ECOSYSTEMS APPROACH?

The ecosystems approach describes a system of complete integration. For example, when thinking about the various elements relating to technology implementation, such as the readiness of households, teacher training and infrastructure (such as electricity and connectivity), all of these elements must be aligned for the technology to thrive and be successful. When policies, teacher training, technology and infrastructure are integrated and embedded within existing systems of the Ministry of Education and potentially with other ministries, this can lead to more successful outcomes for EdTech. Strong relationships with such institutions and stakeholders are also necessary.

Lessons of efficient implementation can also be seen from the GEC and Foreign and Commonwealth Development Office (FCDO) country office response to COVID-19 school closures, which demonstrated that coordination with donors with existing interventions to identify the needs of girls was necessary prior to intervening. The GEC/FCDO team ensured that gaps were only filled by agents who had experience and expertise in implementing that specific technology. Those who had the ability to respond and pivot quickly to changing circumstances were the most successful. The team also ensured reaching the most marginalised learners was central to interventions, as technological interventions often risk focussing on the mainstream at the expense of the marginalised. The team was able to do this by having a strong gender and equality framework integrated within the pedagogy and keeping safeguarding at the centre of their activities.

Efficient implementation is also underpinned by project processes that involve good digital monitoring for attendance, transition and learning data. These projects were more successful as they were able to monitor interventions in real-time and adapt/pivot interventions quickly whilst needs were still relevant. See iMlango project below for an example of this.

3. Project findings

The findings are categorised below in terms of strong, promising and weak VfM (*Box 2*), and are built from the experiences of the 11 reviewed Girls' Education Challenge projects and their unique contexts at that point in time (*more details on this in Annex 3*). Wider empirical evidence from EdTech Hub and Global Education Evidence Advisory Panel has also been factored into the judgements. As the findings indicate, the judgements are based less on the inherent technology type and more on contexts, management, sequencing and cost structures within the long and short term.

Strong VfM

The examples within this category have been sampled from GEC projects. These project interventions are likely to offer strong VfM, by being low cost with large-scale benefits that are likely to be sustainable. These interventions are more likely to be replicated or scaled up either by donors or governments.

Satellite enabled TV for learning

PROJECT EXAMPLE #1

Making Ghanaian Girls Great!, Plan International, Ghana – satellite enabled distance learning

Technology incurred by the project is central to the Making Ghanaian Girls Great! (MGCubed) project design in Ghana, led by Plan International. The project was initially designed to work with schools, drawing on solar-powered, satellite enabled distance learning infrastructure to deliver interactive learning sessions to students, teachers, communities and government officials in Accra and the Oti region of Ghana. The project transmitted live lessons into 72 schools in Ghana, which were delivered by Master Teachers from four central studios that worked with in-class teachers to teach and deliver the literacy, numeracy and life skills content.

Satellite and enabled TV for learning proved to be very effective in supporting girls' education attainment across literacy, numeracy and transition (for those in Primary Grade 6 to Junior High School, which is a key point at which girls may be more likely to drop out). Girls' interpersonal skills, resilience, and self efficacy also increased through the life skills training delivered by MGCubed. MGCubed also found evidence that resilience and academic self-efficacy are mutually reinforcing, and that academic self-efficacy supports self-esteem, literacy, numeracy and attendance outcomes. Interpersonal skills were also shown to support learning and transition outcomes.

The project spent an estimated 70% of their budget on technology components, which cost approximately £183 per girl per year. This figure is significantly higher than the government running replication costs of the EdTech equipment for the equivalent number of schools (estimated annual cost per beneficiary of £32). But despite the relatively high costs, MGCubed has been able to showcase high cost-effectiveness due to their rapid response to pandemic and school closures. During this time the project acted very quickly to springboard the technology, by working with the Ministry of Education to broadcast primary and secondary learning episodes on television, reaching over 3 million children[9] through the Ghana Learning TV (GLTV). This is a good example of how a project can exploit the sunk costs of investment within the project boundaries to reach a much larger number of beneficiaries through technology.

MGCubed is also a strong example of how technology-based approaches can be used to respond to demand shocks, and how they can be rapidly scaled up to reach learners at a national level, whilst simultaneously reducing the potential learning loss from widescale school closures. When factoring in this scale up into the original cost model, the cost per beneficiary would have been significantly lower, with fixed costs spread over many more beneficiaries, therefore reaping economies of scale.

MGCubed was able to demonstrate good equity, as evidenced in the project's endline evaluation, which noted that the project distributed 2,565 TVs and 2,650 decoders to girls and boys with disabilities to facilitate access to GLTV broadcasts. This enabled the most disadvantaged and technologically unconnected households to tune into the TV channel and receive learning at a distance. In addition to this, the project introduced sign language into videos to ensure content was accessible for children with hearing disabilities. Project monitoring verified that households covered by MGCubed used the decoders to tune into educational TV, and that sign language was effective. MG3 worked with the government to make the presentation of the lessons more gender-sensitive, more inclusive (teaching methodology) and accessible (sign language).

The project also displayed good evidence of sustainability. The project's endline evaluation noted that their plan for handing over distance learning technology 'exemplifies' sustainability, as the responsibility of managing the studios and continuation of funding the infrastructure will be transferred to the Centre for National Distance Learning and Open Schooling (CENDLOS). The government now has plans to offer the video or live content through another platform to enhance face-to-face learning. In this, they are demonstrating the role distance learning content can play in complementing and enhancing school-based teaching, by creating new learning spaces at the household level and involving caregivers in pupils' learning. MGCubed also played a central role in influencing reviewing the government's existing policies and programmes from a gender, equality and social inclusion perspective, sharing lessons on gender, safe school environment and inclusion. Additionally, the 72 schools have the full recorded package of programmes. Post-closure monitoring indicates that they are still using this content in a cost neutral way; electricity is provided by solar support (which the project set up) and they have trained school and district staff on upkeep and repairs of this equipment.

Video-based behaviour change content

PROJECT EXAMPLE #2

Discovery Project, by Impact(Ed), Kenya, Ghana and Nigeria – video technology for life skills

The Discovery Project, led by Impact(Ed), provides a good example of how video technology can be used to support behaviour changes with social norms. Based on themes from CAMFED's scripted curriculum and covering a range of topics related to girls' education and life skills, My Better World (MBW) was developed by a pan-African team. It is a DVD series of animation and documentaries. It was originally piloted in DVDs in girls' clubs of 180 schools across Kenya, Ghana and Nigeria which gave rise to strong positive outcomes, i.e. there was a strong link between girls watching videos and an increase in self-efficacy.

The Discovery Project, led by Impact(Ed), provides a good example of how video content can change behaviours and social norms. Created by Impact(Ed) and a pan-African team, *My Better World,* is an entertaining 55-episode television series created to build life-skills and change harmful social norms among young people in Kenya, Ghana and Nigeria. Informed by CAMFED's life-skills curriculum, storylines were co-created through workshops with youth in all three countries. These story-driven programs seek to build self-advocacy, confidence and problem-solving abilities among African youth through a fresh format that combines animation with real-life issues and documentary segments.

It was originally developed to be distributed through broadcast media and nearly 2,000 partner schools that were part of the Discovery Project. For various reasons it was piloted through DVD distribution

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[9] World Bank. 2022 *Ghana: Online Education for delivering learning outcomes during covid 19 school closure* https://www.worldbank.org/en/results/2022/05/16/afw-ghana-online-education-for-delivering-learning-outcomes-during-the-covid-19-school-closure

to only 180 schools across those three countries. Mass media distribution through broadcast continued as planned. Broadcast and club/community screenings gave rise to strong positive outcomes, i.e. there was a strong link between girls' watching videos and an increase in self-efficacy, aspirations for educational achievement, building projects to fix female toilets, and cancelled early marriages.

Despite the limited DVD/school-based distribution, Impact(Ed)'s model gave rise to strong VfM. Between 2019 and 2020, it scaled operations and reached a combined national audience of nearly 190 million across the three countries of implementation and in four languages. As part of the project's COVID-19 response for all three countries, with an eye toward reaching more of the most vulnerable girls (especially in Kano, Nigeria, and arid and semi-arid regions of Kenya), the My Better World series was adapted for radio. In Kenya, the series was aired on multiple radio stations in Kiswahili and Somali. In Nigeria, the animated series was available to tens of millions of learners in both Hausa and English, as early as July 2020 including Radio Kano, which extended the reach to millions of more young people who reside in rural, remote locations, where TV ownership rates are lower.

This was found to be highly effective upon girls' agency, self-efficacy, and life skills at endline. Girls across all three countries were able to articulate how they found the My Better World content relatable to their own experience and how this helped them understand new ideas about gender. Boys articulated the similar changes in attitudes and behaviors. These views were triangulated by parents, club mentors and teachers during interviews at endline. MBW's use of fictional characters, paired with real-life stories, proved effective in encouraging reflection and discussion of sensitive topics in settings where they often are not even acknowledged. In Nigeria, an impact study[10] conducted by the World Bank showed that girls had increased aspirations to complete secondary education and university, as well as statistically significant gains in life skills and positive shifts in parents' attitudes around early marriage and motherhood. In Ghana, between the midline and endline evaluations, qualitative findings showed a strong link between girls participating in the girls' club and watching MBW videos to an increase in self-efficacy; girls indicated they had increased confidence, they were able to negotiate for themselves, and communicate their goals clearly to others.

LEARNING #2

The key factors that drove the VfM:

- Strong small-scale piloting that yielded concrete results.
- Pre-existing relationships and trust with government and other relevant stakeholders such as TV stations and other media outlets to work quickly and efficiently.
- Sunk costs of investment spread over a larger number of beneficiaries, which allowed the project to reap economies of scale.
- Good pre-existing relationship with the government.
- Strong needs assessment to ensure inclusivity for marginalised girls and central integration of gender, equality and social inclusion.

The cost per beneficiary after scaling up for the COVID-19 response was a very low $0.01 per beneficiary. Since then there has been new funding crowding in to replicate and scale up the existing content. There are also plans to create new content in existing and new regions.

Promising VfM

The examples in this section are on firm ground to offer VfM in the future. But for stronger cost effectiveness and sustainability, costs may need to come down further, benefits need to be greater, they need to be implemented differently, or the intervention is simply not feasible for scale up at this point in time. The evidence is also more limited in this category.

Distance teaching and learning technology-based packages including radio, SMS, and voice calls

A GEEAP report[11] found that weekly one-on-one, targeted phone calls by teachers and mentors to parents or caregivers and/or students (in Botswana, Bangladesh, and Nepal), resulted in cost-effective improvements in learning in most but not all cases (Sierra Leone). The report also found that mobile phone-based interventions have been highly cost-effective in some settings, mostly middle-income countries, and less so in low-income countries. Overall, phone-based programming through text messages and teachers calling students and/or caregivers is a highly promising approach, although it has not yet been tested at large scale. It is particularly useful in contexts where lack of computers makes computer remote learning impossible. These findings are consistent with GEC evidence.

PROJECT EXAMPLE #3

Girls' Enrolment, Attendance, Retention and Results (GEARR), PEAS, Uganda – distance learning with radio, SMS and voice

The GEARR project, led by PEAS, provides a good example of distance learning and the use of technology along with non-technological elements to ensure marginalised girls within varying contexts were reached. The project introduced four education technology components/interventions during the COVID-19 pandemic and related school closures, including radio lessons, telephone trees, SMS and learning packs (non-tech). This blended approach allowed GEARR to reach a wide range of children and have a positive impact on their learning outcomes.

[10]Orozco-Olvera, V. and Rascón-Ramírez, E. 2022. *Improving Enrollment and Learning Through Videos and Mobiles: Experimental Evidence from Northern Nigeria.* Accessed 11 Jan 2023.
https://dx.doi.org/10.2139/ssrn.4221220
[11]Global Education Evidence Advisory Panel. 2022. *Prioritizing Learning During COVID-19: The Most Effective Ways to Keep Children Learning During and Post-Pandemic.* The World Bank.
https://documents1.worldbank.org/curated/en/114361643124941686/pdf/Recommendations-of-the-Global-Education-Evidence-Advisory-Panel.pdf

For girls supported by the PEAS project, both the combination of learning packs and radio programmes had a significant effect on learning progress during the pandemic. The project's radio lessons reached 95% of the target audience, and over 50% of PEAS students tuned into radio lessons, which demonstrates high levels of effectiveness as the project was able to reach many children through this medium. However, 37% of students surveyed at endline reported that they did not have access to a radio or knew what time the broadcasts were on (25%).

A separate study also found that girls had significantly more interest in tuning into broadcasts than boys.[12] For boys, the activities that influenced learning progress, in order of diminishing effect were reading SMS messages, speaking to teachers and then using learning packs. The SMS and Telephone Tree interventions were much more effective at maintaining students' well-being and safeguarding whilst schools were closed but were much more limited in learning (this was not the interventions' primary intention).

In terms of costs, the package of interventions was cost effective. The distance teaching and learning package comprised 11% of the total project budget. The annual cost per beneficiary figures for radio, telephone trees and SMS retrospectively were £3.54, £0.12, and £0.16.

The success of the PEAS radio lessons intervention can also be attributed in part to the support provided by teachers in Zambia and the UK in developing the radio scripts for the lessons. The project was able to capitalise on resources paid for elsewhere giving rise to good efficiency. The scripts were used in Uganda and Zambia, and sample scripts were also shared online.

PROJECT EXAMPLE #4

Let Our Girls Succeed (Wasichana Wetu Wafaulu), Education Development Trust (EDT), Kenya – solar radios and lights for distance learning

During the COVID-19 pandemic, the Let our Girls Succeed project in Kenya, led by Education Development Trust (EDT), made adaptions to their programme to include the distribution of solar radios and lights to support girls with distance learning during school closures. The project aired pre-recorded radio lessons in two counties where the radio channels could be easily accessed by children. These lessons focused on improving learning outcomes (literacy and numeracy).

EDT's programme adaptations to include learning through radio were highly relevant. Prior to EDT's intervention, radio lessons delivered by the Kenyan government which were excluding 80% of learners in informal settles, and children in remote, rural areas where radio signal was not available. In response, the project worked closely with local FM radio stations to expand the current reach of radio lessons to those within these excluded areas. The project also distributed radio lesson timetables, tips for parents in supporting learning at home, and tutorial materials to support girls within informal settlements too, which increased listenership. Project findings indicated that most girls on the programme (69.9%) listened to the radio lessons at least once a week, of which 28.9% listened to them every day.[13]

Overall, radio lessons appear to show some effectiveness as seen by an increase in listenership and evidence of minimal learning losses during the peak of school closures. There were mixed results in terms of the impact of radio lessons on learning and it is difficult to disentangle cause and effect. In numeracy, girls who did not access radio lessons at home had lower mean scores (17.2) compared to those who accessed radio lessons (20.3). However, in literacy, girls with no access to radio had a higher score with a mean of 38.8 compared to those who accessed with 34.3, which could be a result of girls using learning books instead. Girls in arid and semi-arid lands who did not access learning materials and radio lessons during school closure were more affected with school closure than those in Urban Slums of Nairobi County who did access learning materials.[14]

Survey data indicated that the radio and TV were the most popular platforms either alone (33%) or in groups (31%), followed by project learning tutorials (30%), and use of WhatsApp by teachers and coaches (21%). The sharing of solar powered radios in cluster groups of girls helped expand access to girls even further. Evidence from other projects, such as TEACH (see below), emphasises the benefits of groups of girls coming together for home and community learning via communal radio listening. Those benefits were highly likely to have occurred in this project too. This is backed up by additional evidence from a report by the EdTech Hub.[15] The report indicated that the use of radio and television lessons was not significantly associated with higher learning outcomes when they listened to radio individually.[16] However, when they accessed the radio as a group the girls scored significantly higher in both SeGRA (5.0% higher median) and SeGMA (3.9.% higher median).[17]

The intervention was low-cost; the project spent £16 per beneficiary annually for solar radios/lights and radio broadcasting. The radio lessons also incurred a very low cost with an annual cost per beneficiary of less than £1, making the radio lessons very cost effective. The project did not have to spend any additional resource on creating radio lessons – their goal was to increase access to them, which is far more cost efficient than creating new content.

[12] Damani, K., Daltry, R., Jordan, K., Hills, L., and Evans, L. 2022. *EdTech for Ugandan girls: Affordances of different technologies for girls' secondary education during the Covid-19 pandemic*. Development Policy Review, 40 (S2). Accessed 11 Jan 2023. https://doi.org/10.1111/dpr.12619

[13] Findings extracted from an internal report (Rapid Assessment Survey).

[14] Findings extracted from an internal report (Rapid Assessment Survey).

[15] Amenya, D., Fitzpatrick, R., Mvungu, E.N., Naylor, R., Page, E., and Riggall, A. 2021. *The Power of Girls' Reading Camps Exploring the impact of radio lessons, peer learning, and targeted paper-based resources on girls' remote learning in Kenya*. [Working Paper 32]. EdTech Hub. Accessed 11 Jan 2023. https://zenodo.org/record/4923094#.Y8RLc3bP2Uk

[16] (Ibid, p. 59)

[17] Senior Grade Reading Assessments (SeGRA) and Senior Grade Mathematics Assessments (SeGMA) were conducted to assess girls' learning levels when they returned to school.

There are also some good indications of sustainability too, as the radio lessons are still continuing. Some radios were given back to some schools and are being used for learning purposes within the school.

Teach and Educate Adolescent Girls with Community Help (TEACH), International Rescue Committee (IRC), Pakistan – radio lessons

The TEACH programme, led by IRC in Pakistan, also introduced radio lessons to the programme in light of the COVID-19 pandemic. The project used a twin-track approach to deliver radio lessons throughout the pandemic, including using radio lessons to supplement face-to-face tutoring lessons and to provide a foundational exposure of the learning content to girls who had no direct tutoring opportunities. The project demonstrated good cost-effectiveness and it positively impacted girls' learning at endline. Other organisations continue to use the radio lessons to support girls' learning, and these have also been added onto YouTube to increase viewership and use.

TEACH's radio lessons were highly relevant. The project conducted a Rapid Needs Assessment which enabled them to better understand the emerging risks to girls' safety, protection and wellbeing. It also helped identify the platforms required to reach girls and households, and particularly those in remote, inaccessible communities where there is a lack of schooling options. The radio lessons were consistent with the Government of Balochistan's Approved Accelerated Learning Packages and life skills curriculum and provided an additional layer of learning to support during the pandemic. For girls who had access to home-based classes, a blended approach was used to their education; radio lessons were used to reinforce their learning after face-to-face tutoring.

TEACH's radio lessons appear to be effective, with findings of high levels of listenership coupled with positive learning outcomes caused by wider distance learning measures additional to radio. Numeracy scores increased from 43.97% to 77.21% and literacy, due to distance learning, increased from 41.27% to 83.26% from baseline to endline.[18]

Additionally, further reinforcing impacts of the radio lessons were the 'listening buddies' groups; 72% of girls were reported to come together with a shared listening device and discuss the radio lesson after. The project observed that radio

supplemented with face-to-face medium of instruction and/ or organised group listening improved regular listenership and access, as well as associated learning outcomes.

In response to low levels of listenership early on, the project adapted and expanded reach by broadcasting through channels which had better access to rural locations. Endline evaluation findings confirmed that 100% of the distant learning cohort had access to radio/audio devices by endline (which was a 50% increase from baseline).

TEACH's radio intervention has an annual cost per beneficiary of £17, which is broadly in line with other projects' radio costs. There are also some early signals of scaling and sustainability; the government has indicated positive buy in of the radio lessons. Radio lessons are now part of a digital library being made accessible to other non-formal education actors in the future. Scale up of the radio lessons can be achieved at a relatively low unit cost for the entire districts of Baluchistan, given that the fixed cost of development, review and production of these lessons have already been incurred, so the average cost per beneficiary would be lower in time. Organisations such as Mercy Corps have started to use these materials at district-level schooling too. The audio lessons are now freely available and over 3,000 lessons have been downloaded so far. The lessons are also now available on YouTube.

- Working with local radio stations to increase access is necessary and beneficial for remote areas and a good low-tech solution.
- Not only does radio bring the benefits of access to isolated girls in a cost-effective way, but it also gives structure to community learning where there is no formal teacher. This is especially important for girls facing social restrictions on travel due to Purdah for example.
- The benefits of communial group radio listening are strong, giving rise to interaction and social contact.
- Adopting a blended approach to deliver the distance teaching and learning is cost-effective.
- Using shared resources from 'tried and tested' interventions in other countries is cost-effective.

Innovations in smart phone-based professional development

Messaging potential is strong for supporting student learning, teacher professional development and supporting refugees' learning, as evidenced in the EdTech Hub Rapid Evidence Review.[19] Social media apps, such as WhatsApp video, audio and messaging are useful for learning in terms of delivering content and fostering interactions, either alone or to complement other methods. Caregivers are gateways to mobile phone access. Such apps can also foster collaboration in the household, with culturally relevant design of materials. There is some evidence to suggest that these apps may promote equity in terms of students in remote locations, students with disabilities, refugees, and girls' education.

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[18] TEACH's project endline evaluation is not yet available online.

[19] Jordan, K., and Mitchell, J. 2020. *Messaging apps, SMS & social media: Rapid Evidence Review.* The EdTech Hub. Accessed 11 Jan 2023. https://edtechhub.org/wp-content/uploads/2020/10/Rapid-Evidence-Review-Messaging.pdf

PROJECT EXAMPLE #6

Supporting Adolescent Girls' Education (SAGE), Plan International, Zimbabwe – training with WhatsApp

COVID-19 school closures meant the SAGE project, led by Plan International, could not access its volunteers to facilitate delivery of continued professional development trainings within its community-based learning hubs. Volunteers reported competence gaps in supporting girls with disabilities (31%) and remote teaching (85%). The widespread use of, and access to, WhatsApp within Zimbabwe (70% of volunteers had access) provided a means of efficient communication and engagement in real time at scale. The project quickly responded by adapting low-cost WhatsApp technology as a platform to maintain contact with volunteers and to deliver continued professional development trainings.

Through continued reflection on the use of the technology and feedback from volunteers, the SAGE programme modified its approach on WhatsApp usage by making it more volunteer and practice driven. The modified approach allowed an integration of offline tasks, which volunteers would practice before the actual remote WhatsApp training. Through this approach, volunteers were able to receive trainings, which included: disability support, progress assessments; screening assessments; psychological First Aid training; supporting virtual reflective conversations; and learning differentiation. Training materials were succinct, accessible and compatible with smart phone access. Two-hour WhatsApp workshops for facilitators posed key questions grounded in the case studies provided. Later, the model moved to smaller group training with sessions focussing on 'Plan, Do, Feedback, Reflect,' with staff from hubs across districts working as sustainable geographical communities of pedagogic practice. As COVID-19 restrictions eased, the training model has become a blended CPD model with the benefits of the hybrid approach recognised and retained.

Evidence from volunteers' feedback was positive, showing that about 88% of volunteers were able to participate in the trainings and of these about 98% confirmed that the trainings are helping in addressing their needs.[20] A further 98% of volunteers, in a survey conducted a few months later, self-reported that they are using inclusive gender-sensitive pedagogy in their sessions (versus target of 80%).[21] A girls' survey showed that 92% and 98% of girls strongly agree to the following statements: *"I am able to participate in the lesson and activities,"* and *"My CEs [community educators] encourage me to learn,".* There is no evidence yet on the impact of the training on learning outcomes.

[20]Internal Quarterly Report (Q9)
[21]Internal Quarterly Report (Q12)
[22]Data extracted from TEACH's Q15 CPD Effectiveness Survey.

PROJECT EXAMPLE #7

TEACH, IRC, Pakistan – teacher training with WhatsApp

In addition to radio lessons, TEACH provided continuous professional development for teachers through WhatsApp during the COVID-19 pandemic and related school closures. This intervention showed great promise, as the training was widely accessible to teachers and relatively low cost. It seems to have been effective, as teachers spoke highly of the intervention. However, there is no data on whether the intervention was effective in practice, i.e. on students learning and/or classroom practices.

TEACH produced a total of 40 lessons on WhatsApp, based on the subjects of language, mathematics, general knowledge and teaching strategies. The project formed WhatsApp groups consisting of learning facilitators, whereby audio lessons and instructions were sent to teachers. Teachers were able to use the group to listen to the lessons, share feedback and ask any questions.

TEACH's professional development via WhatsApp seems to have been very effective, as 89% of interviewed facilitators reported that the lessons were clear and fully understandable to them, along with 91% of respondents sharing that WhatsApp continuous professional development was a beneficial initiative.[22] Although most respondents experience bad internet connection (73% respondents), 88% of those interviewed did receive lessons via WhatsApp and most of the respondents believed continuous professional development helped them to improve their knowledge, skills and teaching methods (83%). There is no information on the students' views of teaching improvements due to the training.

Overall, TEACH was able to quickly pivot key training delivery during school closures at a relatively low cost. This intervention is promising, as it demonstrates that low-tech, low-cost platforms can be used to enhance technology usage on a project in the short term.

Although there has been little dialogue around the sustainability of the intervention, it served a great purpose during a time of limited in-person teacher training.
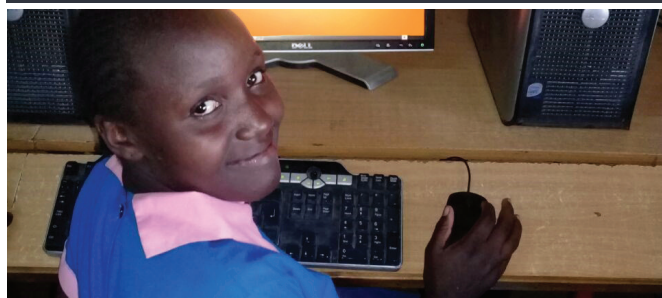
LEARNING #4

- The innovative and quick use of low-cost, high reach platforms via apps and social media for audio, video group calls and content can plug gaps efficiently.
- Modifying the design of learning activities delivered through EdTech from real-time data received through the tech enhances the success of the intervention.

Online learning content with digital monitoring

The integration of differentiated or personalised learning with real-time monitoring can be a key strength within EdTech programmes. The use of the data from each student brings information to allow teaching to be individualised and tailored quickly. This in turn lays the foundations for better programming and ultimately better outcomes because project design can be fine-tuned in real time.

PROJECT EXAMPLE #8

iMlango, Avanti Communications, Kenya – online personalised maths learning content

iMlango provided reliable online maths learning content to children within their schools in Kenya. Endline findings indicated the online lessons had a positive impact on the learning needs of girls. However, the project was not very sustainable, as literacy licenses have not been renewed (expensive), and therefore depend on future funding.

The reliable provision of online maths learning content was a positive and central part of the iMlango project. The Maths Whizz software offered personalised learning to each child, using real-time formative assessment to tailor the content to meet individual needs, which was good for adapting content in real time. It was effective, as endline findings indicated an improvement in learning outcomes for girls and teaching quality. Sustainability is a challenge. Post-project closure, the literacy content licences have not been renewed, but the maths content has been renewed by NGO funding. Going forward, this challenge can potentially be addressed by using commercial Fremium models – whereby initial basic software is given for free and enhanced features are paid for.

This innovation has the potential to be catalysed into much greater cost effectiveness if it had featured a different type of implementation. iMlango implemented it through an unsustainably high-cost school desktop computer lab model with high license fees. A more feasible alternative implementation model is one demonstrated by a project outside the GEC – the VSO Onebillion project experience in Malawi.[23] Onebillion provides educational hardware and software designed to deliver literacy and numeracy to children in their own language. In this model, similar personalised learning content was distributed to schools in Malawi, but instead of using desktop hardware it used low-cost tablets, which offered better cost effectiveness and sustainability. Whilst Onebillion is still exploring the scale up process in Malawi, there are promising results on cost effectiveness.

There will still remain other contextual difficulties that need to be addressed in the iMlango setting. The challenges of sustaining connectivity in remote areas revealed the value in pursuing a blend of online and offline learning content.

Overall, it is important to consider whether the cost per child of the components required for online learning in low-income settings (e.g. the provision and maintenance of education licences, connectivity, technology, and the associated human resources) can be afforded, sustained and scaled by schools, once funding is reduced/stopped. These are necessary requirements for strong VfM.

PROJECT EXAMPLE #9

Discovery Project, ImpactEd, Ghana, Kenya and Nigeria – video technology for learning and teaching resources

The Discovery Project was able to combine the professional development of teachers with video technology and teaching resources. The technology displayed some good effectiveness, as teaching practices improved. However, the sustainability of the intervention could be better, as there were only modest indications of the technology being sustained post closure.

The Discovery Project provides another good example of how video technology can be used to support learning gains, the completion of primary schooling and the transition to secondary school, and to enable the pursuit of both educational and life goals in Ghana, Kenya and Nigeria. The project combined the professional development of teachers with video technology and teaching resources with the intention of improving attendance, teaching and learning outcomes. The technology was found to be moderately effective in all three countries – evaluation data showed improvements in teaching practices and in treatment compared to control groups and good rates of transition. Teachers found that videos helped them to engage students by making lessons more interesting, to support students to visualise what they were being taught and to connect this learning with their own real-life experiences. In terms of learning outcomes, Nigeria produced the most gains in learning out of all three countries.

A key requirement of sustainability for this component is the ability of schools to secure funds to power and maintain the video/media equipment that the Discovery Project implemented – there were only modest indications of this. Accessibility and sustainability could have been enhanced if it had been provided online rather than through hard drivers in schools. The average annual cost per beneficiary for the whole project costs across all three countries is £27. The costs for the technology aspect of the project have not been separated out, but could be cost effective based on the relatively low cost per beneficiary for all the project activities together.

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23 Schmitt, L. 2021. *Scaling personalized learning technology in Malawi: Lessons from our sandbox with onebillion.* EdTech Hub. Accessed 11 Jan 2023. https://edtechhub.org/2021/08/17/scaling-personalized-learning-technology-in-malawi-lessons-from-our-sandbox-with-onebillion/

LEARNING #5

- Technology can provide projects with the opportunity to collect and use real-time data to inform project planning and fine tuning in real time. This can lead to better programming and, ultimately, better outcomes, if the information is accurate and acted on efficiently.
- The integration of differentiated or personalised learning with real-time monitoring can be a key strength within EdTech programmes.
- For content driven activities, careful consideration should be given on the lifespan of hardware, whether this is sustainable, or becomes quickly obsolete and the implications of scale up.
- Implementation models should consider designing content and using platforms that will be easy to scale in the long-term.
- Cost implications of renewing licenses should be factored into an economic cost model integrating sustainability.

Assistive technology for access and learning for girls with disabilities

PROJECT EXAMPLE #10

Expanding Inclusive Education Strategies for Girls with Disabilities in Kenya, Leonard Cheshire – assisted devices

Leonard Cheshire was able to provide good VfM through its provision of assistive devices to children with disabilities, which were highly equitable and cost-effective against alternative solutions. However, there is no clear evidence to suggest their EdTech interventions improved learning outcomes.

The 'Expanding Inclusive Education Strategies for Girls with Disabilities in Kenya' project, led by Leonard Cheshire, introduced innovative assistive technology, including Orbit Readers and Dolphin SuperNova software to ensure that girls with disabilities (mainly visual impairments) could have ever-increasing access to education in inclusive learning environments (*Box 4*). The project also trained teachers in the use of the devices.

This design was built on the premise that:
- The education landscape for children with disabilities can be revolutionised through assistive technology when mainstreamed across all planning, including infrastructural planning.
- Inclusive education is more cost effective when using assistive technology (relative to specialist schools), as it is a strong enabler. Whilst there is a need for initial high investment decisions to be made, over time costs will decrease as the scale increases, and VfM will be maximised.

BOX 4: ASSISTIVE TECHNOLOGIES

Technology used by Leonard Cheshire during the 'Expanding inclusive education strategies for girls with disabilities in Kenya' project:

- Orbit Readers: lightweight, portable, assistive technology devices that help individuals with visual impairments read and take notes in braille.
- Dolphin SuperNova Software: provides magnification, screen reading and Braille support that enables a user to explore a computer screen and read information in ways that suit their visual impairment needs.
- Clicker8 software: supports learners with reading and writing difficulties, such as dyslexia, by helping children to learn through a multisensory approach of using words, pictures and sounds, to keep learners interested and motivated. This is achieved through the use of tools such as screen magnification for learners with low vision, text to voice for those who are blind, etc

At a lower cost per child, including children with disabilities in mainstream education, this not only equips them for life, but also normalises inclusion and challenges harmful attitudes from an early age.[24] A UNESCO study in Pakistan found that special schools were 15 times more expensive per pupil than mainstream schools.[25] This finding shows some consistency with findings from the 2022 World Bank Landscape Review of ICT for Disability-Inclusive Education, which emphasises that ICT tools can have a catalytic effect in advancing both educational access and learning outcomes for children with disabilities. Despite tremendous potential, a gap exists between technology advancements and their large-scale application in educating children with disabilities in low and middle-income countries.

The Orbit Readers were obtained at a cost of £750 per device. Whilst this is a high cost, it is offset against the cost of attending special schools with all the negative social effects associated with segregation. Articles show that orbit readers can cost up to 80% less (£341) compared to traditional Braille displays which can cost around £2,113 per device. Because Orbit Readers work directly from e-readers, it can cut out the need for printing/distribution of Braille media (which would incur higher costs).[26, 27] Therefore, Orbit Readers are relatively better value for money compared to traditional devices that achieve the same purpose.

[24] Watters, L. 2022. *Value for Money: Why investing in children with disabilities is worth every penny.* Able Child Africa. Accessed 11 Jan 2023. https://mcusercontent.com/fe9cf646366b74f289f2650d0/files/a59bd8b3-6471-ead0-b5e6-ede5a65d7920/Value_for_Money_Why_investing_in_children_wi.pdf

[25] Global Education Monitoring Report Team. 2020. *Global education monitoring report, 2020: Inclusion and education: all means all, Easy to read version, key messages, recommendations.* UNESCO. Accessed 01 11 2023. https://unesdoc.unesco.org/ark:/48223/pf0000373724 and accompanying background paper can be found here: Hersh, M. 2020. *Technology for Inclusion.* UNESCO. Accessed 11 Jan 2023. https://unesdoc.unesco.org/ark:/48223/pf0000373655

[26] Perkins School for the Blind. *Comparing Braille Me to APH's Orbit Reader 20.* Accessed 11 Jan 2023. https://www.perkins.org/resource/braille-me-and-orbit-reader-braille-display-comparison/

[27] Chong, C. 2017. *The Orbit Reader 20: The Most Inexpensive Braille Display.* Accessed 11 Jan 2023. https://nfb.org/sites/default/files/images/nfb/publications/bm/bm17/bm1709/bm170912.htm

The project also supplied laptops to project schools, on which the Clicker8 software had been uploaded. Training was provided (both in person and remotely) to teachers on how to support learners with intellectual disabilities and learning difficulties in mainstream classrooms with the software. Teachers reported that the software was not only useful for individual learners, but also for the whole class via data projectors supplied by the Ministry of Education. Ideally, one laptop per class was necessary, but the project initially bought one laptop per school, relying on efficient planning and rotating of laptops between teachers.

The main result from this pilot (introducing assisted devices) was that they improved inclusive access for girls with disabilities. This is cost-effective relative to specialist schools, but a balance needs to be struck with inclusive approaches and individualised support. Given the low incidence of children with visual and hearing impairments, the project may need more individualised support, i.e. training teachers to use the devices, and these costs will need to be incurred, perhaps through clustering the children using the devices in a specialist setting. There are clear trade-offs between inclusive approaches and tailored, individual support.

There was no data to indicate the impact the devices had on other outcomes such as learning, transition or sustainability.

The project also highlighted that introducing technology gradually is necessary. This means that technology should be introduced alongside other measures, such as changing mindsets and culture on technology, building the capacity of teachers to integrate ICT into teaching and learning, ensuring there is adequate infrastructure and electricity, and working with ministries for political buy in and alignment. In addition, detailed needs assessments should take place prior to action. The project stated that the establishment of school-based inclusion teams have played a key role in co-ordination of support for individual learners and ensured that assistive technology solutions are maximised at the school level.

The project also learned that the price of assistive technology can be brought down when purchased at scale. This has been evident from a South African example of tendering[28], which showed that cost effectiveness can be improved by:

- Locally developed apps
- Use on mobile devices
- Open-source tools
- Universal accessibility features in standard software packages
- Having assessment and selection processes embedded within the Ministry of Education
- Ensuring the provision of technical support and maintenance to drive the most value out of the devices.

The Assisted Technology 2030 report also discusses the foundations for market shaping and systems-level change for implementing assisted technology at scale in countries for people with disabilities.[29]

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- It is important to consider the scaling of devices to reduce costs. This would require national networks of support and potentially a cross subsidy.
- ICT can promote inclusive access for children with disabilities. This could potentially diminish the need to attend more expensive specialist schools in some cases.

ICT training

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Jielimishe (Educate Yourself), I Choose Life (ICL), Kenya – ICT roll out and teacher training

To promote a more holistic approach to introducing technology, the Jielimishe project in Kenya, led by ICL, provided ICT for learning training to teachers alongside the rollout of technology in classrooms, including smart whiteboards, projectors, projector screens and laptops. It worked with the Teacher Service Commission. The intervention provided promising VfM, as it was highly relevant, effective (learners cited improved academic performance due to effective teaching methods by their empowered teachers), and showed promising sustainability as the maintenance costs of equipment should be covered post-closure. However, this was a very expensive intervention; £1,556 was spent on ICT equipment for each school.

The ICL project worked with 38 schools that had suitable infrastructure to adopt smartboards and laptops, so that the introduction ICT was feasible and relevant. During this time, the government was also introducing a digital literacy programme, so the timeliness and fit of the project with the wider policy landscape was strong and relevant.

For schools that were not connected, the project discussed the best approach with them and provided laptops with batteries for backup and encouraged them to pair with neighbouring schools so that devices could be borrowed and returned. The project was also attentive to the needs of the schools. ICL conducted surveys in schools to check the status and resource needs of ICT overtime.

[28] In 2018 the procurement of assistive technology was facilitated by the publication of a national transversal tender by the SA National Treasury. See Editmicro. 2020. *RT275-2020 Assistive Technology Tender.* Accessed 11 Jan 2023. https://editmicro.co.za/rt275-2020-tender/
[29] World Health Organization and the United Nations Children's Fund (UNICEF). 2022. *Global Report on Assistive Technology.* Accessed 11 Jan 2023. https://www.who.int/publications/i/item/9789240049451

Surveys conducted in the endline evaluation indicated that the interventions were effective. 85% of teachers found the training useful, effectively infusing it in lesson preparation, delivery and assessment. This had a positive impact on learners, with 71% citing improved academic performance due to effective teaching methods by their empowered teachers.

Feedback from teachers and learners indicated that using ICT helped them to pronounce, read, understand and progress. The ICT also created greater engagement and enjoyment amongst learners. Teachers reported that ICT strengthened their modes of teaching, allowing new pathways to engage students in classrooms. However, there were some challenges concerning insufficient training time and limited ICT resources in schools, which inhibited greater use of ICT methods in classes. Overall, teachers' performances were relatively high in the endline evaluation (84% in terms of their capacity to effectively integrate ICT into the classroom) and consistent with their feedback in teacher competency assessments and feedback from students.

The cost effectiveness of the intervention remains inconclusive. The project spent an average annual cost per teacher trained of £98, and £1556 for ICT equipment per school. Costs could be reduced if newer technology is used, for example teacher owned smart phones to ultramobile LED projectors. The project stated that whilst the initial cost of purchasing laptops and interactive whiteboards is high, they felt that there was potential for strong benefits. The project created ICT champions to do cascade training, which widened the benefits of the initial investment and saved on training costs.

The intervention also shows promising sustainability, as there have been agreements with schools around the absorption of equipment maintenance cost. Schools gained financial support through the alumni network for funding for the ICT equipment. The trained teachers have been recognised by the Teachers Service Commission as champions and will continue offering support to the schools.

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LEARNING #7

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- A gradual approach of introducing ICT training to teachers alongside the introduction of new technology devices seems promising.
- More modern types of hardware offer better VfM, e.g. teacher owned smartphones and ultramobile projectors.

Weak VfM

In this section, GEC projects' evidence indicates that within their unique contexts, these interventions were either too costly, did not meet the needs of beneficiaries, the benefits were low, or they had limited opportunities for sustainability.

Hardware and satellite

PROJECT EXAMPLE #12
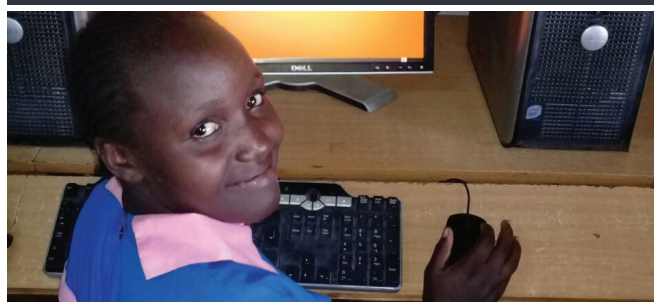
iMlango – satellite technology and desktops

The iMlango project in Kenya used satellite technology and desktop computers to enable schools to be online. The endline evaluation found that this was not cost effective or appropriate. Not only was the cost of this technology extremely high, but the technology requires significant maintenance investments too.

The annual cost per beneficiary for the technology was £43, but the cost per school per year totalled to £32,681. The high cost was driven by internet links and maintenance, education licenses for the content and field staff. These costs are too high to be sustained without external funding. Post-project closure monitoring revealed that the hardware was slowing down and laptops were broken with no funds for repairs.

The government of Kenya has a strong ambition to integrate and expand technology within domestically financed education, but the activities must be realistic and affordable for the government to adopt them – which is not the case for costly satellite technology. There is still promise for the future of this technology, as the endline evaluation indicates that a new model of under £10 per child per year is anticipated – reducing costs to this level presents a radically different proposition in terms of VfM.

Other projects that have implemented hardware in schools outside of the GEC, such as the Tusome project, in contrast present examples of how technology should serve and not guide national reform programmes by serving the education system in the most appropriate and feasible way, rather than driving a reliance on hardware or software.[30] Technology needs to be considered alongside costs, capacity, government digital policy reforms etc., therefore taking an ecosystems approach.

The Tusome programme used tablets to enhance teacher coaching and oversight and focused heavily on building the capacity of its teachers and coaches, leveraging the use of tablets only in so far as it supports this goal. Clear communication, coupled with established initial success allowed the programme to establish trust among internal and external stakeholders alike. This was further strengthened by the transparency that the data collection and sharing via tablets lent to the programme, as well as the culture of positive accountability that it promoted.

[30] Myers, C., Kaye, T., and Khalayleh, A. 2021. *Let's Read – How Tusome leveraged EdTech to improve national learning outcomes. Governing digital transformation: improving outcomes in education systems; case study.* EdTech Hub. Accessed 11 Jan 2023. https://learningportal.iiep.unesco.org/en/library/lets-read-how-tusome-leveraged-edtech-to-improve-national-learning-outcomes-governing

- High initial sunk costs of investment for hardware and satellite should be approached with extreme caution. These interventions are unlikely to show sustainability and hardware will become quickly obsolete.

- Projects should work with and serve national reform programmes, not drive reliance on specific hardware and software. This can make the difference between adoption or abandonment of an EdTech intervention.

Tablets

PROJECT EXAMPLE #13

Closing the Gap, ACTED, Pakistan – piloting tablets for learning

The Closing the Gap project in Pakistan, led by ACTED, undertook a pilot of distributing tablets with offline digital content (accessible via an app) for learning and teacher support. The project concluded that the tablets were not effective due to resistance from parents in rural areas, they were costly, had limited relevance and no sustainability.

Findings from Bangul Khoso (Sindh province) and Karimabad (Gilgit-Baltistan province) suggested that the tablets were ineffective at supporting learning for girls. These areas covered remote rural girls, who did not necessary speak the Sindhi language and parents within these areas also resisted EdTech which they feared were inappropriate, especially for girls. Parents also felt that paper-based worksheets and books would be better. Additionally, sharing a tablet with three or four other learners was counterproductive and inefficient, and it would have been better if the learners were provided more training on using the tablets and were allowed to take them home for unlimited use. Other studies have also found that there can be difficulties with caregivers' attitudes to technology at home due to their perception that some activities will work better on paper than on a screen, such as writing and spelling.[31]

Findings from the urban region of Gulab were more positive. Parents and students were enthusiastic about digital education. Parents in urban areas also associated the use of technology as something higher class individuals would use, and therefore did not want their daughters to be left behind. They would have liked the girls to be able to continue using the tablets at home, as students enjoyed the content and much preferred it to books. However, across the pilot locations, there were no significant improvements found between treatment and comparison centres in learners' performance. Compared to the rural regions of Pakistan, the technology is more familiar and accessible, and parents are more willing to adopt it.

The provision of tablets also demonstrated good equity. Although the digital pilot locations did not include girls with disabilities, the 'zoom' function on the tablet may have helped those with visual impairments to see content much better than paper-based materials.

It is estimated that ACTED spent £7,810 on the tablets, memory cards and delivery costs. This equated to £95 per child for the pilot duration (three months), with 82 learners covered. This was not cost effective. Teachers and facilitators felt this programme was an additional burden as they were responsible for taking care of the tablets.

To conclude, this pilot was found to offer low VfM, being neither cost effective, efficient or sustainable. Therefore, the project did not scale it up.

PROJECT EXAMPLE #14

Sisters for Sisters', Voluntary Services Overseas (VSO), Nepal – tablets in girls clubs

The Sisters for Sisters project in Nepal, led by VSO, also provided tablets in their after-school clubs in schools, filling a digital gap and largely providing English language learning. However, the intervention was not effective, there was limited reach and the cost per girl was extremely high.

Project staff indicated that the effectiveness was compromised by a limited reach and limited skill of the facilitators. Based on 1,392 girls directly benefiting from the clubs, this gives rise to a cost per girl of £728 for the project entirety. This high cost undermined sustainability, thus preventing the ability of schools or local governments to adopt this going forward in the absence of donor funding for replication and scale up.

[31] Osorio-Saez, E. M., Eryilmaz, N., and Sandoval-Hernandez, A. 2021. *Parents' Acceptance of Educational Technology: Lessons from Around the World.* Frontiers in Psychology; 12. Accessed 11 Jan 2023. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.719430

Investing in devices and software needs to be approached with an ecosystems model, a plan for continuous adaptation and relevant cost-effective personalised learning content to make scaling realistic. This finding is consistent with the World Bank report on Smart Buys for Improving Learning[32], which concurs that investing in hardware alone is a Bad Buy, especially when not accompanied by complementary measures. The GEC projects lacked these conditions for success.

In contrast the Onebillion project has made tablets work at scale, and Tusome also shows that it can work for teacher professional development, if deployed at a teacher trainer, not student level and if it works with and serves the national policies at the time, rather than trying to lead and drive reliance on the EdTech intervention.

LEARNING #9

- It is important to consider the relevance of tablets within the local context, in terms of perceptions of the device amongst caregivers and language considerations.
- Caregivers within rural areas sometimes feel paper-based workshops and books would be better and more culturally appropriate, whereas caregivers in urban areas were more enthusiastic about digital education.
- The number of devices needs to be considered, sharing them amongst students, whilst being cheaper, could be ineffective and a false economy.
- Costs and sustainability need to be considered when introducing high value devices.
- An ecosystems approach needs to be taken during intervening, and scaling plans need to be tailored to hardware and software.

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4. Conclusions

It is clear from this review of GEC projects that EdTech investments would, in general, benefit from guidance on both VfM principles and Edtech investment knowhow.[33] More research is needed into overcoming the gender digital divide and a new report is imminently due on this by the EdTech Hub.[34]

Within the EdTech sector, there are many challenges to ensure VfM, due to the fast-paced nature of the sector, the relatively high costs of some equipment, barriers in low-income countries due to lack of connectivity, political engagement, household resistance and cost implications (supply side). Different investment decisions are necessary depending on the timescale and the supply side nature of the country. Such investments span low tech to high tech options, both on hardware and software, and across different purposes such as learning, teacher professional development, monitoring and behaviour change activities.

The experience of the GEC portfolio demonstrates that if sound investment decisions are made separately for the short and medium term, there is strong potential for better educational outcomes for marginalised girls at lower costs. This can set the foundation for scaling up in the longer term so more children can benefit overall. Such investment decisions are context specific, but the findings in this report can still be useful to others.

This review of 11 projects found that the strongest examples of VfM in projects were characterised by careful coordinated consideration prior to intervening, to fill in gaps in the digital landscape with the right expertise at the right time and right scale. Success was further underpinned by political buy-in and a digital policy within government, ability to scale and sustain the interventions, ability to reach marginalised communities at a reasonable cost, being flexible in approach and programming, undertaking strong needs assessments, and strong real-time monitoring to allow adaptations. Some of the best examples of cost effectiveness were of GEC projects pivoting quickly in response to the COVID-19 pandemic and scaling 'tried and tested' technologies in partnership with relevant stakeholders.

In general, the adoption of an EdTech intervention is more likely to be successful if the project works with and serves national digital reform plans, rather than trying to drive them. Within a specific country this might look like making simultaneous investments in low-cost, low-tech initiatives to reach marginalised learners now, as well as more expensive infrastructural investments for future planning.

Along with the GEC, the EdTech Hub are in the process of producing a report that will examine the factors (implementation components, organisational components, and external influencing factors) that have facilitated the effective delivery of EdTech interventions and contributed to successful outcomes across the GEC portfolio. This report will be of benefit to the GEC programme and to others implementing girls' programmes within the technology sector.

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Annex 1: GEC Value for Money Review methodology

The GEC Value for Money Framework aims to offer a quick, pragmatic methodology to review the value for money of a GEC project by using existing evaluation findings. The framework uses the OECD DAC criteria (relevance, efficiency, effectiveness and sustainability) and evaluation findings. Then, it reframes them through a value for money "lens", drawing out the key features of the findings that point to strong, efficient value generation for the right people against optimal costs and resource allocation.

Effectiveness

The GEC approach to value for money analysis relies on extracting effectiveness data from the evaluation reports (at midline and endline). This should include all the different types of outcomes assessed (learning, transition and sustainability) and the intermediate outcomes, such as wellbeing and life skills, self-esteem, social norms and behaviour changes. It should also include data on effective interventions for different targeted subgroups. All types of data used to demonstrate effectiveness are relevant for value for money purposes (quantitative or qualitative data, including the beneficiaries' voices on what they found most valuable).

Effectiveness can either be assessed for a GEC project as a whole or a separate component. Some projects' midlines or endlines may be able to disentangle the impact and causality of specific interventions on outcomes over and above others. This likely will only be feasible for evaluations with a comparison group.

Cost-effectiveness

With activity-based budgeting, specific interventions can be assessed on cost-effectiveness. Costs can be presented in cost per girl format, with a narrative attached to it, explaining the overall cost per girl achieved in observed outcomes. The number of girls reached by interventions can differ, thus giving rise to very wide-ranging figures. These variances should be discussed within the value for money analysis. Benchmarking similar projects within the same context would be helpful.

Suppose there are strong, statistically significant findings, with a control group of girls displaying the counterfactual 'without project' learning achieved in a year of schooling. In that case, the analysis can be taken further to estimate the Cost-Effectiveness Ratio (CER): additional years of schooling per $100 spent.

Relevance

The GEC approach to value for money and relevance uses evaluation report findings to understand whether resources were allocated to meet the needs and objectives identified upfront and whether optimal resources were allocated across activities. If such needs changed over time, the Value for Money Review should consider whether resources were reallocated to reflect this to maintain the relevance of the programme.

An equity angle to relevance would determine whether or not the right beneficiaries were targeted by the project according to needs and if enough or optimal resources were allocated to various targeted groups. The analysis should consider whether, in retrospect, the budget would have been carved differently across activities to reflect relevance better and whether there was a correct allocation of funds for technical functions, monitoring and evaluation, management etc.

Sustainability

Sustainability within the GEC is measured by:

1. A long-term continuation of outcomes for the direct beneficiaries themselves (including targeted schools and communities).

2. Replication and scale-up or adoption of project activities without the need for FCDO funding.

A project may have sound input costs (Economy), have a demonstrated ability to translate its activities into quality outputs (Efficiency), and achieve its targets concerning learning and attendance (Effectiveness), but may not have a strong sustainability case. Sustainability is not always covered in the conventional measures of value for money. But it is another factor to justify the expenditure. The evidence of evaluation findings on contributions to sustainability should be integrated into a value for money narrative. Evidence of replication or scale-up beyond project funding would indicate very strong value for money.

Sustainability intent may have been present from the start in specific design features or plans. But over time, as contexts have changed, contributions to sustainability may not have materialised. This may require projects to undertake additional activities targeting sustainability that increase their costs but do not necessarily improve their efficiency or effectiveness in the short term. These should be considered in a Value for Money Assessment. Another angle to considering costs and sustainability is defining the minimum spend for activities required to achieve sustainable outcomes. For example, determining the cost of a minimum amount of project exposure/duration or intensity necessary to achieve sustained outcomes based on findings.

Efficiency

Taking a narrative approach, assessing efficiency involves understanding how smoothly processes and interventions have been delivered (speed, quality, cost). There are four aspects to efficiency:

1. Whether the project as a whole was delivered on time and budget

1. Assessment of the speed, quality and cost of the operating models for each intervention and the project as a whole

2. Assessing the efficiency of processes and management of the project as a whole

3. Assessing the efficiency of targeting girls (inclusion or exclusion errors).

Limitations of the GEC value for money approach

The value for money analysis is dependent on the evaluation findings, so its efficacy depends on the efficacy of the evaluation findings. It is also dependent on projects' ability to produce expenditure data in relevant formats (activity-based budgeting). Value for Money Assessments such as these are not often appropriate for making comparisons with other projects due to differing contexts, cost structures and activities.

Annex 2: Reviewed projects and evidence rating

This section provides a high-level summary of each project studied for this Spotlight Brief. The GEC is not specifically focused on Edtech. The choice of projects reflects those which used Edtech, and the availability of evidence.

This annex includes the project dates, overview and EdTech related activities. Each project has also received a RAAG rating for the strength of evidence to support this study. Projects have been rated on their ability to meet the criteria below:

1. Strong outcomes are evidenced by testing for statistical significance through a rigorous evaluation design (i.e., randomised controlled trials, difference in difference approach, tracking girls across time points, etc.).
2. The project is able to provide a link between education technology and outcomes (i.e., learning, lifeskills, etc.) through rigorous evaluation design.
3. The project is able to provide a link between education technology and outcomes (i.e., learning, lifeskills, etc.) less rigorously, i.e., through qualitative surveys and evaluations.
4. The project will have provided relatively accurate expenditure/cost data relating to education technology activities.

GREEN – the project is able to meet all of the criteria points above.

AMBER – the project is able to meet three to two of the criteria points above.

RED – the project is only able to meet one or none of the criteria points above.

IMLANGO, AVANTI COMMUNICATIONS
APRIL 2017 – JUNE 2021

The iMlango project was a technology-driven project, investing in girls' education in Kenya at 205 primary and 40 secondary schools. The project was operational in four mainly rural Kenyan counties: Kajiado, Kilifi, Makueni and Uasin Gishu, which predominantly supported marginalised girls. The project aimed to address the barriers of poor-quality teaching and learning environments and community barriers of unemployment, poverty, social norms surrounding girls' schooling and dropout rates due to pregnancy and marriage. The project's EdTech activities included:

- Installing IT hardware in schools, including computer labs and projectors in classrooms with high-speed broadband.
- Introducing digital learning content (maths, literacy, and life skills) to learners.
- Providing continuous professional development for teachers, which included guidance to ensure timely technical maintenance and support for the digital aspects of the project.
- Providing electronic smart cards to students to help them register their attendance at school.

Strength of evidence: AMBER – the project was able to evidence impact on learning outcomes for girls during the endline evaluation and it is likely that the introduction of technology supported this outcome (technology in schools was a core component of the programme). However, the data was collected remotely, and no learning assessments were conducted at endline. The learning and EdTech data (Maths Whizz) came from the project and was only for the intervention schools. The project's midline, however, was better, and it was able to evidence the impact of digital learning content on students' learning through surveys with children. The project was also able to provide relevant cost data for the EdTech components of the project. The endline also had a strong VfM section.

CLOSING THE GAP, ACTED
DECEMBER 2018 – MARCH 2023

ACTED supports out-of-school girls aged 10 to 19 years in Sindh and Khyber Pakhtunkhwa, which are two areas with some of the lowest learning outcomes and challenging social environments for girls and women in Pakistan. The project recognises the multiple barriers to education that the most marginalised girls face in Pakistan, including financial barriers, lack of qualified female teachers, insecurity and acceptance of girls' education. The project's EdTech activities included:

- 3-month pilot of digital content on tablets that was accessible offline for Accelerated Learning Programme (ALP) girls. This was provided through an app for learning and teacher support.

Strength of evidence: AMBER – the project was able to evidence impact on learning outcomes for literacy and numeracy for girls during the endline evaluations, but EdTech was not used for the literacy and numeracy cohorts. The 3-month tablet pilot was used with the younger ALP cohort, but the pilot found through surveys that the tablets were poor VfM and thus it was not scaled up. The project was also able to provide relevant cost data for the EdTech components of the project.

MAKING GHANAIAN GIRLS GREAT!
PLAN INTERNATIONAL
MAY 2017 – JANUARY 2022

Technology is central to this project's design. The project initially worked with schools, drawing on solar-powered, satellite enabled distance learning EdTech infrastructure to deliver interactive learning sessions to students, teachers, communities and government officials in Accra and the Volta region of Ghana. Following school closures, the project worked with the Ministry of Education to broadcast primary and secondary learning episodes on television. The project's EdTech activities included:

- Delivering 3,122 hours of remedial lessons and 916 hours of by-grade lessons.
- Broadcasting 420 learning episodes in English, maths, social studies, and science on the television channel Ghana Learning TV (GLTV).
- Distributing 2,585 TVs and 2,650 decoders (enabling households to tune into the channel) to the most disadvantaged unconnected households.
- Providing technical assistance to the Ghana Education Service on creating 144 episodes of audio-visual content including sign language for Senior High Schools.

Strength of evidence: GREEN – the project was able to evidence EdTech related project activities through multiple evaluation sources. Midline evidence included rigorous evaluation methods and included the EdTech components. Monitoring data collected by the project in 2020 was robust and helped to evidence the positive impact of GLTV on girls' learning through surveys with girls. Although the endline was completed during COVID-19 related closures, the project used exam data to compare the mean grades of girls. The project was also able to provide cost data for the intervention.

GIRLS' ENROLMENT, ATTENDANCE, RETENTION AND RESULTS (GEARR), PROMOTING EQUALITY IN AFRICAN SCHOOLS (PEAS)
APRIL 2017 – JUNE 2021

PEAS operated the GEARR programme in Uganda to improve access to quality education for marginalised secondary school children. PEAS target and enroll marginalised children into their 28 schools within Uganda, of which most girls come from either rural communities, households living under $1.90 a day, and/or are at risk of early marriage or pregnancy. The project offered teacher training in English and mathematics, and in approaches that are more sensitive to gender, and facilitated Girls' Clubs to provide girls with safe spaces to develop their skills and build their confidence. The project's EdTech activities were introduced during the COVID-19 pandemic, and these included:

- Airing 538 hours of secondary level radio content on nine radio stations across Uganda, followed by a further 32 across 13 stations in 2021 with a focus on well-being and re-enrolment (570 hours in total across 2020 and 2021).
- Airing 205+ hours of radio talk shows on psychosocial support and well-being.
- Implementing a telephone tree system to allow teachers to contact students via phone calls every two weeks to check in on their learning and to share important information during school closures.
- Sent out over 20,000 safeguarding SMS to students and caregivers with a focus on health and safety, child protection, and positive wellbeing during school closures.

Strength of evidence: AMBER – the project was able to evidence the impact of EdTech on learning outcomes through qualitative data collection methods (surveys) at endline. However, the project did not conduct learning assessments at endline, nor collect data from treatment and comparison schools to identify the average intervention effect with a difference-in-difference estimation at endline. The project was able to do this at midline, but these results did not reflect the impacts of the EdTech interventions. Cost data was available for this project.

EXPANDING INCLUSIVE EDUCATION STRATEGIES FOR GIRLS WITH DISABILITIES IN KENYA, LEONARD CHESHIRE
APRIL 2017 – MARCH 2022

Leonard Cheshire aimed to increase the educational and vocational opportunities of girls with disabilities in five counties within the Lake Region of Kenya. It tackled the specific barriers that girls with disabilities face to improve their quality of life, skills and livelihood opportunities. The project worked to build positive attitudes and community support for disabled children, helped girls to transition through primary into secondary school, vocational training and self-employment, and provided transportation and assistive learning devices to allow girls to attend school. The project's EdTech activities included:

- Providing 14 Orbit Readers, and training on how to use them, to teachers through Google Meet and WhatsApp.
- Installing software packages on laptops that helped learners with intellectual and visual impairment to learn.
- Distributing laptops to 25 primary schools and to Education, Assessment and Resource Centres in the sub-counties the project operated within (a total of 30 laptops).

Strength of evidence: AMBER – the project used a mixed-methods approach in evaluations (quantitative and qualitative) and tested for statistical significance in their learning results by comparing data from baseline to midline evaluations (a sample of girls with disabilities representative of the project population that was tracked across time periods). However, the project did not review/assess the impact of their EdTech activities in the project evaluations. Data/evidence received for their EdTech components were through interviews with the project. Cost data was available for this project.

SISTER FOR SISTERS' EDUCATION, VOLUNTARY SERVICES OVERSEAS (VSO)
APRIL 2017 – JUNE 2021

VSO worked with 64 schools to improve the education of marginalised girls in the Dhading, Parsa, Lamjung, and Surkhet districts of Nepal. The project helped girls transition from primary to secondary school and leave school to continue with their education or secure employment. The project also provided remedial after school classes for girls, in which well-performing students in higher grades (Big Sisters) provided academic support and mentoring to students in lower grades, and feedback to teachers the areas in which they needed to provide additional support in class. The project's EdTech activities included:

- Formed English and Digital Girl's Education (EDGE) clubs for 1,392 learners, which helped to fill the gap of a lack of computers in schools and knowledge on how to use them.
- Provided students with tablets in the EDGE clubs.

Strength of evidence: AMBER – due to the impact of COVID-19 related closures, the project faced pandemic restricted mobilities during data collection at endline. Remote data collection was not feasible with the control group, and therefore, the endline evaluation was conducted without quantitative comparisons across treatment and control groups (treatment and control group present in project's midline and baseline evaluations). However, the project did use rigorous evaluation methods during midline by using the difference-in-difference approach, which allowed VSO to measure the effects of the project intervention over time between the intervention and control group. Additionally, the project conducted in-field qualitative consultations involving representatives of the control groups, which provided qualitative comparisons and insights on perceptions of learning across treatment and control groups at endline. The project was able to provide cost data for the intervention.

DISCOVERY PROJECT, IMPACT(ED)
APRIL 2017 – DECEMBER 2020

Impact(Ed)'s approach combined professional development of teachers with video technology and teaching resources. These were used to support learning gains, the completion of primary schooling and the transition to secondary school, and to enable the pursuit of both educational and life goals across projects in Ghana, Kenya, and Nigeria. The project's EdTech activities included:

• Providing educational video content (through DVDs) and teacher professional development to improve the quality of education for children.

• Producing the 'My Better World' television and radio life skills series based on themes from CAMFED's print curriculum to develop students' knowledge, attitudes, and skills as well as to shift parent and community norms in support of gender equality and social inclusion during the COVID-19 school closures.

• Providing mobile phone-based support to 4,000 to 6,000 teachers comprising refresher training and check-ins on teachers' well-being during the COVID-19 school closures.

Quality of evidence: AMBER – Data at midline was comprehensive and robust, and EdTech components were included. At endline, the project was only able to report on learners' perceptions of learning progress, as learning assessments could not be conducted due to COVID-19. Impacts of learning at endline were validated through 'learner checks' (monitoring data) and through information collected by teachers in classes for a small subset of schools which received all project inputs. Data was not available for Kenya at endline. Additionally, the endline evaluation reports only on the quantitative impact on self-efficacy, but they were able to provide a link between EdTech and improved outcomes for girls through surveys. This project did not have cost data, nor a breakdown of their EdTech components.

JIELIMISHE (EDUCATE YOURSELF), I CHOOSE LIFE
APRIL 2017 – JUNE 2022

The Jielimishe project aimed to improve the life of marginalised girls in primary and secondary schools in three counties across Kenya (Laikipia, Meru and Mombasa). The project focused on increasing girls' motivation to learn through girls' clubs and mentorship schemes, improving the quality of teaching through teacher training, coaching and mentorship, and encouraging local communities to support girls' education. The project's EdTech activities included:

• Rolling out ICT training for teachers and introduced smart whiteboards and laptops to schools.

• Working with teachers to deliver interactive lessons online during COVID-19 school closures.

Strength of evidence: AMBER – the project adopted a mixed-method approach using qualitative methods for data collection only at endline, therefore only perceptions of learning were recorded for girls. The endline did not include any learning test data due to COVID-19 school related closures. However, they did test for statistical significance in learning results from baseline to midline evaluations (comparison and treatment groups used). The evaluation was able to link the ICT to the improvements in teacher training results. Cost data was available for this project.

LET OUR GIRLS SUCCEED (WASICHANA WETU WAFAULU), EDUCATION DEVELOPMENT TRUST
MAY 2017 – MARCH 2023

The WWW project works with highly marginalised girls living in arid and semi-arid lands and slum areas in Kenya by providing primary school girls with the qualifications, skills and confidence necessary to successfully transition to a productive next phase of life. The project also helps girls to transition to alternative pathways focused on employment and technical and vocational education and training (TVET). The project's EdTech activities included:

• Rolling out coaching in schools and piloting ICT support for teachers and learners to improve learning outcomes for students.

• Providing schools with 2,446 tablets and 540 projectors (496 in primary schools and 44 in secondary schools).

• During the COVID-19 pandemic, the project used EdTech to support children with learning remotely:

 – Distributing solar radios and lights which ensured continuity of learning at home.

 – Airing pre-recorded radio lessons in two counties where the radio channels could be easily accessed. These lessons focused on improving learning outcomes (literacy and numeracy).

Strength of evidence: AMBER – the project completed a Rapid Assessment Study and Special Assessment Study to calculate scores for learners at (internal) midline. The Special Assessment Study evidenced statistically significant results in relation to mean scores for learners. Additionally, the project completed two sets of learning assessments at midline. However, the project's qualitative data (i.e. interviews with teachers) was limited and not enough to explain trends in home schooling during COVID-19 related school closures, therefore they were unable to link EdTech activities back to learning. Cost data was provided by the project.

TEACH AND EDUCATE ADOLESCENT GIRLS WITH COMMUNITY HELP (TEACH), INTERNATIONAL RESCUE COMMITTEE (IRC)
FEBRUARY 2021 – JANUARY 2023

The TEACH project aims to target 29,000 highly marginalised and out-of-school girls between the ages of 10 to 19 in five deprived districts of Balochistan province in Pakistan. The project adapted their interventions in light of the COVID-19 pandemic (during school closures) to reach girls through a blended support programme that delivered education close to/within the homes of adolescent girls. The project's EdTech activities included:

- Producing 144 radio programmes designed to help girls in the Balochistan region of Pakistan to develop literacy, numeracy and life skills. Radio lessons supplemented face-to-face tutoring lessons, and provided a foundational exposure of the learning content to girls who had no direct tutoring opportunities.

- Using TV to raise awareness of girls' education in Balochistan through dramas and animated clips to raise awareness of safeguarding and gender, equality and social inclusion (GESI) issues.

- Providing facilitators with continuous professional development through WhatsApp on language, numeracy, teaching strategies, classroom management, pedagogy, GESI, safeguarding and disability inclusion.

- Using social media to circulate information on COVID-19 and share information about the timings of radio programmes.

Strength of evidence: AMBER – the project employed a longitudinal and non-experimental evaluation design of pre-post assessment; therefore, no control groups were established, and they did not test for statistical significance. However, the project adopted quantitative tools at endline, and included two learning assessments i.e. EGRA Urdu based tool and EGMA-based tool to measure learning. There was no data present in the endline evaluation on Teacher training through WhatsApp. The project was able to link the radio intervention (distance learning) to improvements in girls' literacy and numeracy results. Cost data was available for this project.

SUPPORTING ADOLESCENT GIRLS' EDUCATION (SAGE), PLAN INTERNATIONAL
AUGUST 2018 – JULY 2023

The SAGE programme targets highly marginalised, out-of-school adolescent girls in 11 districts across Zimbabwe providing high quality learning opportunities to help them achieve and support them to transition successfully into formal education, training, or employment (including self-employment). The programme focuses on providing high-quality, non-formal education across 88 girl-friendly community-based learning hubs and aims to deliver sustainable change through skills training, improved access to financial resources, engagement with civil society and government stakeholders, and mobilising parents, boys and the wider community to adopt more positive gender attitudes to support and protect girls. The project's EdTech activities include:

- Implementing an e-learning platform accessed by learners through 18 of the project's learning hubs.

- During COVID-19, the project introduced a combination of low-tech distance learning responses to support teachers, students, and volunteers during school closures, this included:

  – Delivering teacher continuous professional development through mobile. This was further adapted to include peer-to-peer learning and face-to-face clusters to improve the support.

  – Using WhatsApp to maintain contact with volunteers and teachers.

  – Using a blended approach, involving both in-person and WhatsApp training of community educators.

Quality of evidence: RED/AMBER – the project's midline was an internal review and lacked external verification of the learning data analysed and presented. However, this was agreed to and signed off by the GEC Fund Manager. The project faced limitations as no household survey data was collected, and the learning assessments were not cohort based i.e. not longitudinal. While early results are promising around the e-learning platform, full results will not be available until endline. This is also similar in showing the efficacy of the CPD approach during COVID-19. There was limited activity-based cost data.

Annex 3: Value for Money criteria

The findings are categorised below in terms of strong, promising and weak VfM, and are built from the experiences of the Girls' Education Challenge projects and their unique contexts at that point in time. Such interventions described below may have a different VfM story in a different setting. Nevertheless, these experiences will still provide useful lessons to inform those undertaking or planning similar interventions. It must be noted that the assessments of strong, promising and weak VfM are for the specific Edtech interventions only, not for the projects as a whole.

The definition of low cost in this study is based on expert judgement weighing up evidence from the specific activity costs, what they delivered within that cost envelope and internal and external benchmarking where available.

Strong VfM: The examples within this category have been sampled from GEC projects and are interventions that are likely to offer strong VfM, by being low cost with large-scale benefits that are likely to be sustainable. These are more likely to replicated or scaled up within those specific contexts either by donors or governments.

Promising VfM: The examples in this section are on firm ground to offer VfM in the future. But for stronger cost effectiveness and sustainability, costs may need to come down further, benefits need to be greater, they need to be implemented differently, or the intervention is simply not feasible for scale up at this point in time. The evidence is also more limited in this category.

Weak VfM: In this section, GEC projects' evidence indicates that within their unique contexts, these interventions were either too costly, did not meet needs, benefits were low, or they had limited opportunities for sustainability.

Girls' Education Challenge

UK aid
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This Spotlight Brief was written by Valsa Shah (Value for Money Lead on the Girls' Education Challenge) and Shreena Sidhu (Value for Money and DevResults Manager) with the support of all the projects featured in the Brief.

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