Project Evaluation Report

Report title:	Endline Study and Final Evaluation of iMlango Transitions
Evaluator:	Jigsaw Consult Ltd
GEC Project:	iMlango
Country	Kenya
GEC window	GEC-T
Evaluation point:	Endline
Report date:	February 2022

Notes:

Some annexes listed in the contents page of this document have not been included because of challenges with capturing them as an A4 PDF document or because they are documents intended for programme purposes only. If you would like access to any of these annexes, please enquire about their availability by emailing uk_girls_education_challenge@pwc.com

Girls' Education Challenge

UKaid from the British people

Endline Study and Final Evaluation of iMlango Transitions

Avanti Communications Limited

Date	26-10-2021
Version	Final
Owner	Matthew Thomas
Authors	Matthew Thomas, Dr David Hollow, Rebecca Daltry, Dr Annette Zhao, and Jonny D'Rozario
Phone	0208 960 7067
Email	m.thomas@jigsawconsult.com

Jigsaw Consult Ltd is a company registered in England & Wales under no. 06844615
at 1st Floor Salvation Army Building, Manor Park Road, London, NW10 4JJ.

Table of contents

List of abbreviations and acronyms

BoM	Board of Management
CBC	Competency Based Curriculum
CDF	Constituency Development Fund
CLA	Camara Learning Academy
CSO	Curriculum Support Officer
DAC	Development Assistance Committee
DEO	District Education Officer
DFID	Department for International Development (now FCDO)
DLA	Discovery Learning Alliance
DLP	Digital Literacy Programme
EdTech	Education Technology
EGMA	Early Grade Mathematics Assessment
FCDO	Foreign, Commonwealth and Development Office (formally DFID)
FGM	Female genital mutilation
FM	Fund manager
GEC(-T)	Girls Education Challenge (-Transition)
GESI	Gender equality and social inclusion
GPE	Global Partnership for Education
HOH	Head of household
HT	Headteacher
ICT	Information and Communications Technology
IGA	Income generating activities
IO	Intermediate outcomes
KCPE	Kenya Certificate of Primary Education
KICD	Kenya Institute of Curriculum Development
KII	Key Informant Interview
KNEC	Kenya National Examinations Council
LO	Log odds
MFI	Microfinance
MoE	Ministry of Education
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
PS	Project staff
PTA	Parent Teacher Association
RDM	Research Development and Management Ltd
RQ	Research question
TLM	Teaching Learning Material
TPAD	Teacher Performance, Appraisal & Development
USAID	United States Agency for International Development
VfM	Value for Money

List of tables and figures

Tables

Figures

Executive summary

This report provides the findings and recommendations of the endline evaluation of iMlango Transitions (iMlango-T): an FCDO-funded, Girls' Education Challenge Transition (GEC-T) project in Kenya. The programme ran for four years from April 2017 until June 2021, investing in girls' education through the use of technology in primary and secondary schools. It has been delivered by a consortium of partners, led by global satellite operator Avanti Communications, alongside sQuid (the digital transactions and eLearning solutions provider), Whizz Education (a simulated maths tutoring provider), and Camara Education (a provider of hardware).

The endline evaluation marks the final point of a multi-year external evaluation. It covers the period of the final year of implementation of the project, and follows the baseline evaluation of 2017 (conducted by the African Population and Health Research Center, Inc. and Maxwell Stamp Ltd.) and the midline evaluation of 2020 (also conducted by Jigsaw Consult). The iMlango programme represents a significant and long-term investment of the FCDO and partner resources, and the endline evaluation therefore provides a strategic opportunity to build on the rigorous and independent assessment of the project's outcomes. It also acts as the central product within a wider suite of associated learning products, which contribute towards evidence-building for the wider sector.

The report is structured into ten chapters. Following the introduction (**Chapter 1**), **Chapter 2** expands upon the background of the project. Over the four years of its implementation, iMlango has worked in 205 primary schools and a further 40 secondary schools, the majority of which are located in rural settings, with some in peri-urban regions. The schools are spread across four Kenyan counties (Kajiado, Kilifi, Makueni and Uasin Gishu) that were originally selected due to marginalisation factors, including poverty rates, attendance statistics and learning achievements for girls. iMlango has worked with 99,190 direct beneficiaries (female students) and 106,276 indirect beneficiaries (boys at school, teachers and a range of community members). The activities of the project aimed to improve learning outcomes in English and maths, as well as help marginalised girls effectively transition through the education system. These activities included the provision of high-speed satellite broadband connectivity to schools, individualised simulated maths tutoring and digital whole-class maths content, continuous training and support to teachers, electronic attendance monitoring, microloans, in-field support, a Gender Action Plan and linking schools with safeguarding referral systems. Due to the onset of the Covid-19 pandemic, these activities were adapted to respond to school closures: iMlango continued to reach students through digital tools (including the provision of an iMlango android app and the communication platform, WhatsApp) and to support teachers through online training and the dissemination of teaching and learning materials.

Chapter 3 outlines the methodology of the evaluation, which was designed to assess the outcomes of the project against its Theory of Change and determine to what extent iMlango led to positive outcomes in learning and transition. A mixed-methods approach was applied in a fully-remote capacity, due to the barriers presented by the ongoing pandemic. Data collection tools were designed to address the evaluation's research questions, categorised under four themes: pupil learning and transition; teacher and school leadership practices; project

sustainability, value for money and scalability; and project design and delivery. These tools included a student survey (sampling 383 girls from 32 schools) and key informant interviews with students, teachers, headteachers, Board of Management members, Ministry of Education officials and project staff (70 interviews in total). A mixture of random and purposive sampling approaches were employed to enable a representative sample of schools across the four counties, and data from comparison schools was removed in light of the pivot to remote data collection. An in-country research team of Kenyan enumerators from Research Development and Management Ltd conducted the survey and all interviews, aside from those with project staff, which were conducted by the UK-based Jigsaw team. The data was then analysed (through statistical analysis in R and a mixture of deductive and inductive coding in MaxQDA) and triangulated alongside secondary project data. The remote nature of the study and its methodological limitations (namely, the reliance on self-reported and perception-based data, and the inability to utilise the project's original quasi-experimental evaluation framework and employ cohort tracking) should be noted. However, the theoretical framework of contribution analysis was applied as an appropriate alternative in the sub-optimal circumstances, enabling the evaluation to provide an evidence-based narrative of the contribution of iMlango activities.

The following five chapters outline the key findings of the evaluation. **Chapters 4 and 5** focus specifically on the impact of project activities and the barriers to learning and transition. Overall, it is determined that original project activities did lead to improved learning outcomes, although the Covid-19 school closures acted as a significant hindering factor and led to learning losses. With regard to literacy and numeracy, girls provided self-reported evidence of learning gains, although the KCPE results showed significant variation across the four counties. The project was considered to have led to a greater impact on girls' performance than boys', due to the specific attention paid to girls' education. Technology was said to be a major contributing factor to these improvements: the provision of hardware was highlighted as a major motivating factor for learning and the opportunity for students to become digitally literate was highly regarded. The online literacy and numeracy content (Longhorn reading content, other reading content, and the Maths-Whizz individualised simulated maths tutoring and digital whole-class maths content) were also considered to have led to improved learning outcomes and student enjoyment, although the former was considered to be a less strong component. Various barriers were found to negatively impact the use of technology, namely: the lack of equipment or size of computer labs in relation to class size; challenges with electricity supply and/or internet connectivity; and technical issues with devices.

With regard to students' life skills, iMlango was reported to lead to increases in self-esteem and the girls' clubs were identified as a particularly impactful activity for girls' confidence. Indeed, the project appears to have contributed towards gender equality in the classroom. Activities focused on teaching quality and school governance were found to have some positive impact, but this was less observable than that of learning outcomes. Qualitative data provided evidence of positive attitudes towards teaching, including more student-centred practices and positive contributions towards increasing gender equality, and ICT was identified as having made teaching easier and more effective. Continued professional development was also cited as an important contributing factor to improving teaching quality, impacting upon skills in learner-centred teaching and ICT integration. There was some evidence of the project's impact on school governance. Technology was found to have contributed to this

change: the provision of digital learning and attendance data was shown to have somewhat influenced decision making and technology was shown to facilitate more effective school management processes. The increased sensitisation of headteachers was identified as a necessary project activity in hindsight, to encourage more consistent support for and engagement with iMlango. There was found to be a relatively high level of engagement with the project among county-level education officials, although challenges remain for how this involvement can be built upon and sustained.

The findings also suggest that attendance and enrolment had improved over the course of the project, but these findings were somewhat inconsistent across the different sets of data. In particular, technology was found to be a contributing factor to improved attendance, both in terms of increasing student motivation for attendance through having access to computers and through better tracking attendance through the use of digitised monitoring. Demographic and domestic factors such as the head of household's educational attainment, non-menstruation related sickness, a lack of money and family events were the main reported barriers to attendance.

There was insufficient evidence to assess the extent to which iMlango had made a contribution to improved rates of transition. Although the findings suggest a high level of aspiration to transition to secondary school (a finding which was particularly attributed to parental support), no firm data were available to confirm the extent to which iMlango project activities contributed to this outcome. A lack of money was cited as the main threat to completing school, although over half of respondents stated that they were confident that nothing would stop their progression in education.

An assessment of how iMlango activities responded to the Covid-19 school closures found there to be limited demonstrable impact. Lack of access to smartphones was a limiting factor, and there was lower uptake than anticipated for the app and WhatsApp communications.

Chapters 6, 7 and 8 focus on the sustainability, value for money and scalability of iMlango. Qualitative data suggests that the sustainability of the programme is mixed. Teacher training, the implementation of technology, girls' clubs and ongoing community engagement were identified as core components that are crucial to sustain in the future. However, overall the sustainability of the programme faces significant challenges. These relate to the fundamental financial difficulties of schools sustaining a technology-based project after the main source of funding stops, alongside the more day-to-day implementation challenges such as loss of trained staff due to teacher transfer, engaging with communities and the MoE, hardware maintenance, and disruptions to electricity and connectivity. The chapter also acknowledges that, like many programmes, iMlango found it difficult to respond effectively in the midst of Covid-19 and the pandemic significantly hampered the implementation of the intended sustainability plans.

The assessment of the project's value for money (VfM) demonstrates that the cost per child of the programme is too high to be sustainable. In particular, project components required for the facilitation of online learning in rural Kenya - including the provision and maintenance of education licences, connectivity, technology, and the associated human resources - were consistently delivered at cost per child rates that are too costly to be sustainable or scaled.

Although the nature of the project necessitates that EdTech components will command the majority of project expenditure, the chapter acknowledges that resource allocation on these components had major inefficiencies. Optimising the use of resources was identified as essential in delivering a future project that can offer good VfM through significantly reducing the cost per child expenditure. Comparatively, girls' clubs and teacher training components offered good VfM due to being delivered at a much lower cost per child that schools are able to sustain. As a result, it is recommended that developing a new streamlined approach is critical to achieving good VfM, significantly reducing the cost per child model, and facilitating the on-going flourishing of the programme.

The findings of the endline evaluation also suggest that there are opportunities for scaling iMlango, although with a substantially altered operating model. iMlango was found to demonstrate clear alignment with the Kenyan government's ambition to integrate technology within education, and the learning content was well aligned with the curriculum. It was notable that all MoE officials who were interviewed believed the project could be viable for expansion across Kenya. However, hampered by the current pandemic and the challenges of on-going funding, the ambitions for future scaling are currently somewhat dependent on external factors.

Finally, **Chapters 9 & 10** provide the conclusions and set of recommendations. Overall, the evaluation finds that iMlango has contributed towards positive outcomes for girls in the intervention schools. The project's Theory of Change is found to be largely valid, appropriate and based on sound logic in most areas, but requires review and updating for future interventions.

The report's recommendations are structured by their relevance to different aspects of the iMlango project. With regards to the **strategic future** of the programme, it is recommended that iMlango:

1. Actively aligns with the UK government strategic focus on girls' education, such as through engaging in the July 2021 GPE Summit in London.
2. Streamlines and simplifies the programme, removing less effective components, to position it as a cost-effective solution to improving numeracy outcomes at scale.
3. Calculates the 'cost per child' of the future, streamlined version of the project and ensures this is significantly lower than the present operating model.
4. Systematises project activities, so that good practice can be spread across all participating schools.
5. Develops a clear, realistic and compelling strategy for the future.
6. Acts quickly to capitalise on the momentum of the project.
7. Continues to focus on schools in remote rural regions.

Specific **technical** recommendations are also provided for the future of the programme. It is recommended that iMlango:

8. Builds on the positive impact of the girls' clubs.
9. Includes non-smartphone options for any future home-based learning.
10. Considers making the online training for maths teachers into an open access resource.

11. Communicates clearly and quickly with schools regarding the ways in which the programme is changing and the reduction in activities.
12. Explores the possibility to expand the internet coverage range within schools.
13. Continues to focus on online content, whilst complementing it with offline resources.
14. Builds on and increases the good foundation of training at the school level.
15. Increases the expertise and capacity on gender, safeguarding and inclusive education within the staff team.
16. Invests in more robust tracking of beneficiaries as a core aspect of project management.

With regards to the future **design and implementation** of the project, it is recommended that iMlango:

17. Establishes a more adaptive programme design to lead to more cost-effective impact.
18. Considers a simpler design in the future, with a more deliberate focus on fewer experimental components.
19. Provides transparent full economic costing from the outset.

Finally, recommendations are provided with respect to **programme evaluation** and to **wider sector learning**. It is recommended that:

20. Future evaluation frameworks incorporate the potential of technology (such as real time learning data) within their evaluation design.
21. The programme provides leading edge technical thought leadership that can help shape the EdTech sector, by publishing key project insights and making these widely available.
22. iMlango holds some form of light-touch evaluative review after a period of 'normal' operating conditions in schools, considering the timing of this endline evaluation in the wake of school closures.
23. After the end of full project activities, all parties (iMlango, the fund manager, FCDO and the Kenyan government) should continue to track iMlango schools to understand their future participation and performance.

Chapter 1: Introduction

1.1 Purpose of endline evaluation

This report details the findings of the endline evaluation for iMlango's FCDO-funded Girls' Education Challenge Transition (GEC-T) Fund programme. This was a four-year programme, running from 2017 until June 2021, investing in the use of technology in girls' education in Kenya at the primary and secondary school level. The endline evaluation is the final evaluation point in a multi-year external evaluation and covers the period of the final year of implementation of the project, following a baseline evaluation in 2017 and a midline evaluation in 2020. The baseline was conducted by the African Population and Health Research Center, Inc. and Maxwell Stamp Ltd, and the midline was conducted by Jigsaw Consult. Due to the Covid-19 pandemic, as explained in detail below, the purpose, questions and design of the endline evaluation were adapted. As such, the quasi-experimental approach with the counterfactual scenario comparing learning and transition outcomes of girls in treatment and control groups is not possible. Through consultation with the iMlango consortium, led by Avanti, and the Fund Manager (FM), the revised list of research questions was developed to capture learning for the project and the wider sector. This is articulated in full in Section 1.2.

The iMlango programme represents a significant and long-term investment of the FCDO and partner resources, and it has been widely cited as an example of effective work on using technology in girls' education (see City A.M. article from November 2020[1]). The endline evaluation provides a strategic opportunity to build on all that has taken place, and ensure that the programme benefits from a rigorous and independent assessment.

The evaluation team will ensure that the evaluation (i) fulfils the accountability requirements of the GEC, (ii) provides valuable learning for the strategic future planning of the iMlango partners, and (iii) is of significant technical benefit for the wider sector in addressing pertinent questions relating to girls' education and technology. The methodology and deliverables are all designed in light of these three high-level objectives.

1.2 Research questions

The research questions have been prepared in dialogue with the iMlango Evaluation Review Group and the FM. The research framework does not replicate any questions from the midpoint review, but rather seeks to build on the four thematic areas from the midpoint going into deeper detail in fewer areas. All questions have been designed in consideration of the OECD-DAC evaluation criteria: relevance, coherence, effectiveness, efficiency, impact and sustainability.

Due to Covid-19, the MoE did not allow access to schools for data collection, requiring the methodological shift to remote data collection. As such, the initial list of research questions was further reduced at the point of methodological pivot in February 2021. This decision was

[1] Accessible from: https://www.cityam.com/we-need-business-to-help-us-get-girls-learning-and-change-the-world/

made in light of the available data sources and their ability to rigorously explore the question. *Table 1* below presents the research questions in full, which will explore the assumptions and links between the levels of the project Theory of Change and the project impact more broadly.

Table 1: Research questions

RQ #	Research question	DAC criteria	Data sources
Research theme 1: Pupil learning and transition			
1.1	**Learning outcomes:** To what extent are numeracy and literacy learning level improvements seen? What are the key drivers and barriers to learning?	Impact Effectiveness Efficiency	Monitoring data Teacher KIIs Headteacher KIIs Student survey
1.2	**Transition:** To what extent have the project interventions influenced girls' transitioning through key stages of education, training or employment?	Impact Effectiveness	Monitoring data Teacher KIIs Headteacher KIIs Student survey
1.3	**Additional benefits for learners:** What other forms of learning has the project contributed to? (E.g. life skills, gender equality, knowledge of Sexual and Reproductive Health and Rights, resilience).	Impact	Monitoring data Teacher KIIs Headteacher KIIs Student survey Project staff KIIs Caregiver KIIs BoM KIIs
1.4	**Enrolment and attendance:** What difference has iMlango made to enable marginalised girls to enrol in primary/secondary school and to frequently attend school? What has re-enrolment looked like in iMlango schools?	Impact	Monitoring data Teacher KIIs Headteacher KIIs Student survey Project staff KIIs Caregiver KIIs BoM KIIs
1.5	**Technology:** What do the literacy content and Maths-Whizz tutor add to the learning in the classroom? Do they support learners to develop their understanding of literacy and numeracy in ways that are not possible in their ordinary classroom?	Impact Effectiveness Efficiency Relevance	Monitoring data Teacher KIIs Headteacher KIIs Student survey Project staff KIIs
Research theme 2: Teacher and school leadership practices			
2.1	**Teaching quality:** To what extent has the project been successful at improving the quality of teaching in targeted schools? What factors have contributed to or hindered this?	Effectiveness Efficience	Teacher KIIs Headteacher KIIs Student survey Project staff KIIs Caregiver KIIs BoM KIIs

2.2	**School governance:** How has school governance improved at the school and county level as a result of iMlango? Do headteachers promote and monitor inclusive student centred learning techniques and gender equity at the school? To what extent has the project influenced sub-county/county-level systems?	Impact Efficiency Effectiveness Sustainability	Headteacher KIIs Project staff KIIs Caregiver KIIs BoM KIIs DEO KIIs
Research theme 3: Project sustainability, VfM and scalability			
3.1	**Sustainability:** What mechanisms will enable the gains from iMlango to be sustained?	Sustainability Impact Efficiency Effectiveness	Teacher KIIs Headteacher KIIs Project staff KIIs Caregiver KIIs BoM KIIs DEO KIIs
3.2	**Value for Money:** To what extent does iMlango provide good Value for Money? Did the processes of achieving results justify the costs incurred?	Sustainability Efficiency Relevance Impact Effectiveness	Monitoring data Project staff KIIs DEO KIIs
3.3	**Scalability:** To what extent is iMlango scalable? What scenarios exist for scaling the project, including implications of the Government of Kenya taking the project to scale? What are the opportunities and risks associated with scaling up the technology utilised in iMlango interventions?	Sustainability Coherence Relevance	Monitoring data Project staff KIIs DEO KIIs
Research theme 4: Project design and delivery			
4.1	**Covid-19 response:** How successfully has iMlango adapted its activities to respond to the impact of the Covid-19 pandemic? What is the impact of the app usage for active users? What barriers exist to using and engaging with the app? To what extent have the activities conducted during the crisis (teacher training, TLM dissemination) solidified the benefits of iMlango? How, why and to what extent have teachers been engaged in remote learning strategies during the Covid-19 period? How successfully has the project supported the continuous professional development of teachers during school closures?	Effectiveness Impact Efficiency Relevance Coherence	Monitoring data Teacher KIIs Headteacher KIIs Student survey Project staff KIIs Caregiver KIIs BoM KIIs DEO KIIs

Given the significant impact of the Covid-19 pandemic on the final year of project implementation, the endline evaluation examined the project activities implemented through iMlango's' Covid-19 response. However, it is important to note that the evaluation is not able to draw concrete conclusions about the impact of these activities on learning, transition and sustainability, or the resilience of the intervention schools or project participants. This is

beyond the scope of the evidence available. The evaluation collected and considered evidence of the maintenance of conditions for learning during the school closures through the project's Covid-19 response activities. This included examination of the design of Covid-19 response, the participation of students in Covid-19 response activities, and the overall effectiveness of the response in terms of maintaining conditions for learning and the feedback of students and school-level staff.

1.3 Report structure

The report is structured into ten distinct chapters. In Chapter 1, the purpose of the evaluation and guiding research questions are outlined. Chapter 2 details the background to the iMlango project. Chapter 3 outlines the evaluation approach and methodology, including the main methodological changes made due to Covid-19, the challenges and limitations faced and the guiding research ethics. Analysis begins in Chapter 4 and focuses on the impact of the iMlango interventions. The following four chapters all focus on different areas of analysis and findings as directed by the research questions. Chapter 5 details the barriers to learning and transition, Chapter 6, sustainability, Chapter 7, value for money (VfM), and Chapter 8, scalability. Chapter 9 summarises the key findings and conclusions, and addresses the contribution analysis narrative. Lastly, recommendations are presented in Chapter 10, covering recommendations for project design; project monitoring, evaluation and learning; scalability, VfM and sustainability; recommendations for the iMlango consortium and recommendations for the FM and wider sector. The report concludes with a list of annexes as required by the FM.

1.4 Contribution to learning agenda

The role of iMlango in building evidence for the sector

As noted below, iMlango has been a significant component of the GEC Strategic Partnerships window. As such, it was always intended to be an innovative project that had a mandate to explore new approaches to girls' education and contribute to the knowledge of the sector. Now reflecting back at the completion of the project it is possible to identify three main ways in which iMlango has made a contribution in this regard:

- The use of EdTech for girls' education
- The integration of EdTech programmes with national government priorities
- The role of private sector consortia in delivering large scale implementations

The experience of iMlango has contributed to advancing knowledge in each of these areas. This also provides an opportunity for the project to have on-going positive impact through sharing insights and building evidence, both through formal reports and also active dialogue with decision-makers across the sector. The main contexts within which the experience of iMlango can contribute to shaping future practice more broadly are:

- The future of girls' education investments, particularly through the UK government commitment of £430 million to the Global Partnership for Education fund 'Raise Your Hand' at the recent G7 Summit.

- The future of evidence-driven decision-making in education, particularly through the new evidence platform 'What Works Hub for Global Education' and particularly the Smart Buys.
- The future of evidence-driven decision-making in the use of technology in education, through the EdTech Hub, an FCDO funded global research partnership - with Kenya as one of its focus countries.

In addition to these is the issue of future private sector engagement in leading large scale EdTech interventions with donor funding. This is likely to become more common in the coming years - and will remain contentious and complex to deliver. There is much that FCDO can gain through reflecting on the experience of iMlango as a case study for learning about multi-stakeholder partnerships in EdTech, and the complicated realities of scalability, sustainability, cost-effectiveness, and cost-transfer models.

In summary, there is much within the programme that warrants sharing and can be of use for the wider sector. Not because it all constitutes exemplary practice, but because it will help others to learn and improve based on the experiences of iMlango. Much of this is currently held as tacit knowledge within the programme in the form of staff expertise and experience. The production of the associated learning products - listed below - provides the opportunity to share this more explicitly with a wider audience.

Associated products to read alongside the endline

This endline evaluation is one central product within the wider learning agenda of iMlango and the GEC more broadly. The format of the endline is relatively prescriptive and linked to the original Theory of Change and associated research questions for iMlango. To get the best overall insight regarding the impact of iMlango and the contribution it has made towards evidence-building for the wider sector, the reader is encouraged to engage with the suite of associated learning products also available. These are summarised and linked below:

- The achievements and lessons learned summary, documenting the main learnings at the project's closure, to be published on the GEC website.
- A blog, announcing the project's closure, again for publication on the GEC website.
- Two 'stories', giving greater detail to the experience of individual girls and/or teachers at iMlango schools, to be published on the GEC website and social media.
- The endline executive summary, to standalone from this report.
- The endline dataset, submitted to the UK Data Archive, for public access.
- A powerpoint presentation (including slides and a recording), providing a discussion of the endline findings.

Additionally, Whizz Education produced three publications outlining key project learnings:

- A key insights paper from Whizz Education, providing insight into the specific learnings from this consortium partner.
- A learning loss paper from Whizz Education, highlighting the impact interruptions have had on learning.
- A White Paper from Whizz Education, about the power of using real-time data for course correction, based on iMlango.

Chapter 2: Summary of iMlango

2.1 Background to project

iMlango Transitions (iMlango-T) is a technology-driven project, working in 205 primary schools, and with a further 40 secondary schools. The majority of the schools are located in rural settings, with some schools situated in peri-urban regions. The project is aiming to improve learning outcomes in English and Maths, as well as transition through the education system for marginalised girls.

The schools are spread across four counties (Kajiado, Kilifi, Makueni and Uasin Gishu) that were originally selected based on marginalisation factors (poverty rates, attendance statistics and learning achievements for girls) as well as availability of electricity, safety and accessibility. iMlango is delivered by a consortium of partners led by global satellite operator Avanti Communications. Its partners are sQuid, the digital transactions and eLearning solutions provider, Whizz Education, a simulated maths tutoring provider, and the social enterprise Camara Education. This phase of the project began in April 2017 and finishes in June 2021.

Project Activities

Primary schools and secondary schools are the point of learning delivery. Project activities include:

- High-speed satellite broadband connectivity to schools.
- Individualised simulated maths tutoring and digital whole-class maths content, alongside digital learning content for literacy and life skills.
- Continuous training and support to teachers to use best practices integrating ICT into lessons.
- In-field teams to provide educational support to teachers and leadership guidance to headteachers.
- Electronic attendance monitoring.
- Microloans to support the families to send their daughters to school[2].
- In-field teams to support the schools and ensure timely technical maintenance is delivered. Real-time project monitoring and measurement.
- A Gender Action Plan, including training for school staff and community engagement.
- Coordinating child protection approaches, including linking schools with local safeguarding referral systems.

[2] The microfinance component of the project was not evaluated. The FM did conduct their own monitoring of this and anyone with queries around this can contact the FM on gecpmo@uk.pwc.com to ask for details. Based on this monitoring and the EE's expertise and holistic look at the iMlango project, as well as wider education sector programming, it would be highly unlikely that a recommendation to include microfinancing in this type of project would be included. However, there is no empirical data to back up such a recommendation in this case, and therefore this has not been put forward.

The project works at four levels: the individual (pupil), the school, the community, and the system. The assumption is that the interconnectedness of these four areas should ensure long-lasting results that directly affect all related beneficiaries and stakeholders.

Project Beneficiaries

The total number of beneficiaries worked with over the lifetime of the project are as follows:

Table 2: Total number of project beneficiaries

Beneficiary type	Description	Number
Direct		
Learning beneficiaries (girls)	Girls in the intervention group who are specifically expected to achieve learning outcomes in line with targets.	99,190
Indirect		
Learning beneficiaries (boys)	As above, but specifically counting boys who received the same exposure and therefore expected to also achieve learning gains.	94,655
Teacher beneficiaries	Number of teachers who benefited from training or related interventions.	Total: 5,179 Male: 2,194 Female: 2,985
Broader community beneficiaries (adults)	Adults who benefited from broader interventions, such as community messaging /dialogues, community advocacy, economic empowerment interventions, etc.	Parents/caregivers - 6,189 Community members - 187 MOE officials - 66

For a full breakdown of project beneficiaries, please refer to Annex 8.

Covid-19 adaptations

With the onset of the Covid-19 pandemic, iMlango-T adapted its activities to respond to school closures. An iMlango android app was developed and made available to learners' parents in order to support continued learning where possible during the school closure period. The teaching and learning content on the iMlango portal was adapted in order to be accessible through the mobile app. Through the app, learners had access to digital teaching and learning content including;

- Literacy stories and quizzes
- Maths-Whizz numeracy content
- Children encyclopaedia – Q-files
- Audio podcasts with quizzes
- Safeguarding messages

- GESI messaging - messaging around gender roles
- Covid stay safe messaging

iMlango activities continued to reach out to as many children as possible to provide learning through the digital tools. In addition to this, online teacher training and dissemination of teaching and learning materials became a focus. Communication was enhanced through WhatsApp user groups with teachers and various digital channels with broader stakeholder community groups to ensure GEC-T girls remained supported. The support groups also had a strategic agenda in sensitising the parents on the need to support remote teaching and learning alternatives the project rolled out.

2.2 iMlango Theory of Change

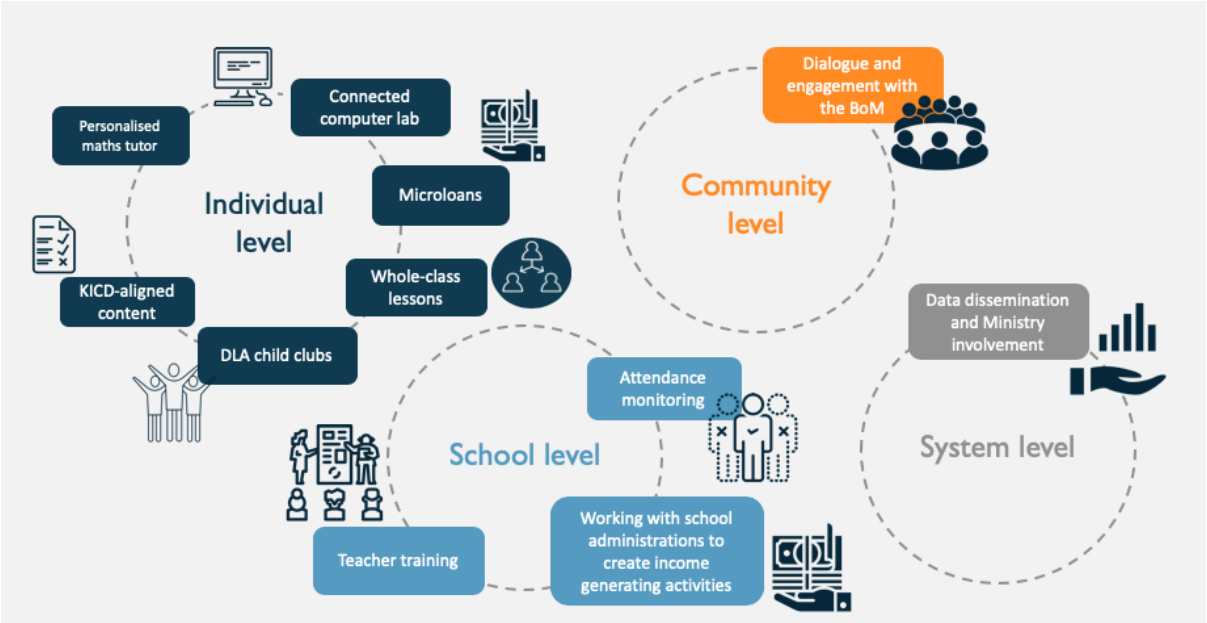
iMlango-T is a continuation of the GEC-1 project iMlango that ran for three years in the same schools and was part of the original Strategic Partnerships window within the GEC. The core project activities remain the same, with a focus on the primary school as the point of learning delivery. In order to achieve the three project outcomes of learning (numeracy and literacy), transition and sustainability, the project has worked towards five intermediate outcomes as the key project objectives:

1. Improved attendance among certain pupil sub-sets in primary schools
2. Improved quality of teaching using ICT by the primary school teachers
3. Learning progress by girls in primary schools
4. Improved life skills for girls
5. Increased use of iMlango reports by key stakeholders to inform their decision-making and actions to support schools

iMlango's Theory of Change seeks to support improvements to girls' learning by providing: (i) teaching and learning interventions focused on the immediate need for higher quality teaching, and better learning content, and (ii) interventions designed specifically to challenge the gendered expectations which act to limit the academic performance, aspirations and progression of the most marginalised girls (and specific groups of marginalised boys - a small percentage of boys with poor attendance are included in the microloan support initiative).

The project works at four levels: the individual (pupil), the school, the community, and the system. The interconnectedness of these four areas is intended to ensure long-lasting results that directly affect all related beneficiaries and stakeholders. The figure below presents the activities provided at each of these levels (for 'A' schools).

Figure 1: iMlango project activities[3]



These activities have a range of associated intended learning outcomes. At the individual level, the personalised maths tutor, KICD-aligned maths content and digital learning content for literacy and life skills, KICD-aligned content, and whole-class lesson plan delivery are designed to help pupils progress in numeracy and literacy, to help them transition to secondary school. Whole-class learning lessons are dedicated 80% to 20% to literacy and maths respectively. The digitised content is delivered through the use of projectors, which is a strategy used in both intervention A and B schools. ICT labs are equipped with approximately 25 computers and are proportionately dedicated in 80% to 20% to math and literacy respectively, which is a strategy used in intervention A/C schools only. In addition to the above for individual level interventions, the provision of microloans aims to address financial barriers in order to support families to send their daughters to school. The Discovery Learning Alliance (DLA) child clubs (now named Impact(ED)) aim to develop life skills and increase the self-esteem of girls to engage more in the project interventions.

At the school level, continuous training and support is provided to teachers to use best practices integrating ICT into lessons. This aims to enhance their capabilities in adopting and integrating ICT into their teaching practices, thereby improving pupil learning. In addition, attendance monitoring allows for greater visibility of pupil attendance, and thus greater capacity to devise strategies to improve attendance. Lastly, the project works with school administrations to ideate and support the creation of income generating activities. At the community level, dialogue and engagement with the Board of Management (BoM) aims to align the project with the school's needs and mission, thereby facilitating stronger buy-in and application of the project interventions. At the system level, data dissemination aims to lead to further Ministry involvement, which in turn helps with the continuous school-level adoption of interventions and sustainability.

[3] Image credits (all from Noun Project): Computer by Denis Shumalov; Exam by Iathiif studio; Sustainability by Made by Made; Meeting by Jesus Puertas; Data by Alfredo @ IconsAlfredo.com; absentees by Priyanka; Income by monkik; Group by SANB; training by Chaowalit Koetchuea

In addition to the above, the project provides high-speed satellite broadband connectivity to schools, in-field teams to support the schools and ensure timely technical maintenance is delivered, and real-time project monitoring and measurement.

Covid-19

A new or revised project specific Theory of Change was not developed in light of Covid-19, although a project MTRP (Covid-19 response) was developed as requested by the FM. As such, the endline evaluation explores how the original Theory of Change was maintained despite the Covid-19 school closures. Although there was no change to the Theory of Change, the operating context of the project was impacted by Covid-19. While this meant that new activities were introduced, the assumptions and links to the original Theory of Change were maintained.

Chapter 3: Evaluation methodology

3.1 Overview of evaluation design

The structure of the methodology is based on the research priority areas shared by the iMlango Evaluation Review group during the inception meetings. A participatory and mixed methods approach was proposed, sampling from the same schools as in the baseline evaluation. The endline interrogates the assumptions behind the Theory of Change and the links between activities, intermediate outcomes (IO) and outcomes. It aims to assess if changes have occurred, and if so, what has caused these changes. To assess the validity of the assumptions between the intermediate outcomes and learning and transition outcomes, a combination of quantitative analysis, qualitative analysis and wider research in the education sector was used.

A decision was made in conversation with Avanti and the FM to pivot the data collection to be fully remote in early February 2021. This decision was the result of conversations with the Ministry of Education (MoE) who was unable to provide permission to collect data in schools. The MoE has since provided permission to collect data remotely. While the overarching aims and objectives of the endline research did not change, the decision to undertake remote data collection resulted in necessary changes to the number of research questions that the data sources can realistically and rigorously collect data on, the data sources, the sample sizes of the instruments, and the length of the tools themselves.

The endline has continued to use contribution analysis as the conceptual framework of the study. The research also maintained a participatory, mixed methods and cross-sectional approach to data collection and analysis as was articulated in the previously accepted inception report. However, some adjustments were made to the methods in consideration of the pivot to remote data collection and necessary changes to research questions and available data sources with which to explore these questions. A summary of these adjustments is included in the list below:

1. **Removal of comparison schools** because of limited time available to collect remote data and ethical considerations around asking girls to participate in phone surveys who did not have an opportunity to benefit from the project interventions.
2. **No cohort tracking** as we are not making a comparison with midline and baseline due to interrupted implementation and a change in circumstances.
3. **Reduced number of treatment schools in the overall sample** due to the logistics of remote data collection in order to retain the number of tools we would like to administer (i.e. in deciding whether to have more schools and less tools or less schools and more tools, we decided the latter would provide richer data in a school-based study approach).
4. **Reduced sample sizes for individual tools** because of the length of time needed to conduct remote surveys and interviews and make contact with participants. Note that this will mean that the sample will not be representative of the beneficiary population, but indicative.

5. **Removal of FGDs and lesson observations** as these are not possible to conduct remotely. Interviews were conducted over the phone in order to ensure these voices were included in the evaluation.
6. **Streamlining the remaining tools** to meet the requirements of reduced time per tool for remote data collection. Sector guidance, in addition to our experience conducting similar evaluations, is 20 minutes on the phone with girls and slightly longer (20-30 minutes) with teachers, headteachers, BoM members, and MoE officials.

Methodological limitations

There are five headline methodological limitations that the reader should keep in mind when reading the study. They were agreed within the evaluation design and have been unavoidable because of the current context, but it is important to highlight them at the outset to ensure that the report analysis is understood correctly.

- Throughout the text the reader should take note of the methodological limitations of the study, namely the reliance on self-reported, and perception-based data. The data has been triangulated wherever possible to increase reliability, but it should be made explicit that this is not a fair proxy for having conducted large-scale learning assessments as originally conceived within the GEC evaluation framework. As is known, the baseline study for the iMlango evaluation (not conducted by Jigsaw) was not executed effectively and did not provide the foundational data-set that was required in order to implement the anticipated three-point longitudinal assessment of numeracy and literacy outcomes. This has been a limitation of the iMlango evaluation throughout. This long-term limitation was further compounded by the inability to access schools in-person for the endline data-collection because of Covid-19 restrictions.
- In addition, the lack of a functioning control group means that it has been very difficult to determine causality within the data that has been analysed. That is to say, it has not always been possible to ascertain whether it is iMlango inputs, or that of another source, that has led to the outputs and outcomes observed. This warrants a degree of caution in interpreting all the findings, and is the justification for engaging in contribution analysis rather than attempting direct attribution analysis which would have been unrealistic in the circumstances.
- Similarly, because it was not possible to visit a randomised selection of schools in person, there should be a degree of caution in extrapolating the findings - both positive and negative. That is, what was reported in the iMlango schools included in the endline data collection is not necessarily representative of what took place in all iMlango schools.
- In addition, requests were made by the external evaluation team for access to learning data related to the literacy content within iMlango. No learning data regarding literacy was provided by the programme and therefore it has not been possible to assess fully the accuracy of the accounts provided through the interviews. In contrast, learning data was provided by Maths Whizz related to the numeracy content within iMlango.
- Finally, throughout the analysis there is on-going reference to the interviews with key informants. It is inevitable that no interviewee has an entirely objective assessment of

iMlango, and each of them bring their own biases. In a conventional endline study, the bias within individual responses would be mitigated or diluted by conducting a larger number of interviews. Because of the methodological restrictions in place, it has been necessary for the study to be unusually dependent on a small number of interviews. Therefore all the analysis of the key informant interviews should be read with this limitation in mind.

Contribution analysis

Originally, the multi-year external evaluation utilised a quasi-experimental methodological framework, with the baseline following this approach. As this approach was no longer feasible for the endline evaluation, an alternative methodological framework was used. Contribution analysis was selected in conversation with Avanti and the FM, as an appropriate analytical approach given the context of the endline evaluation. The following definition of contribution analysis was used:

> *"Contribution analysis is a methodology used to identify the contribution a development intervention has made to a change or set of changes. The aim is to produce a credible, evidence-based narrative of contribution that a reasonable person would be likely to agree with, rather than to produce conclusive proof."*[4]

Contribution analysis is an appropriate alternative theoretical framework for the endline evaluation for the following reasons:

- There are external factors that influence the changes experienced by project participants, and there are other development interventions being implemented in Kenya. This approach recognises that it is difficult to prove attribution for these reasons and assumes that there are usually multiple contributory factors to change.
- Contribution analysis is designed to be used alongside theories of change that explicitly set out how change is supposed to happen, as the project has done. Contribution analysis assesses changes at the different levels of the Theory of Change in order to compare reality with the theory.
- As it is not possible to track a cohort and use a control group, contribution analysis is appropriate as it seeks to reduce uncertainty about change and to help explain how and why changes occurred.
- There has been a significant enough period of implementation of the pre-Covid-19 activities for change to occur.

Contribution analysis follows six steps of implementation, which are outlined below and applied to the endline evaluation process.

Table 3: Six steps to contribution analysis

Contribution analysis steps	Endline evaluation process
1. Set out the question(s) to be	Completed in inception phase in consultation with

[4] Intrac, 2017. https://www.intrac.org/wpcms/wp-content/uploads/2017/01/Contribution-analysis.pdf

addressed	project and FM, and outlined in inception report
2. Develop a theory of change	Developed by project at baseline Determine how the theory of change was maintained and changed for the Covid-19 response
3. Gather existing evidence	Research on context (national policy, other interventions etc.) Analysis of project monitoring data Primary data collection: Phase 1 Primary data collection: Phase 2
4. Assemble and assess the contribution narrative	Analysis of primary data Draft endline evaluation report
5. Seek out additional evidence	First project feedback round on draft report
6. Revise and strengthen the contribution narrative	Second project feedback round on draft report FM feedback round on the draft report

As articulated above, step three of the contribution analysis approach was further strengthened by a mixed-methods data collection approach. This involved exploratory cross-sectional survey data collection, which helped to describe the evaluation context. Alongside the survey, semi-structured interviews were used to explain some of the survey findings, as well as to explore topics and the views of informant groups that the survey did not cover. After data collection, a contribution analysis analytic framework was employed. Within this framework, the results of statistical survey data analysis, qualitative analysis of the interview data, as well as project monitoring data and other relevant literature were used to help establish the contribution of the iMlango interventions.

3.2 Approach to data collection

The approach for the endline evaluation data collection followed a mixed method design, incorporating available project data, quantitative surveys with students, and key informant interviews (KII) with students, teachers, headteachers, BoM members, MoE officials and project staff. The sample sizes for each method are summarised in *Table 3* below:

Table 4: Data collection sample sizes

Primary data collection method	Sample size
Student survey	383
Student key informant interviews	15
Teacher key informant interviews	16
Headteacher key informant interviews	8

BoM key informant interviews	7
MoE official key informant interviews	6
Project staff key informant interviews	18

The primary targets of data collection were iMlango female students. Marginalised girls are the project's primary target participants, and are from poor, predominantly rural communities and from families that are statistically poorer and have lower prior educational attainment than average.

Sampling strategy

Overview of sampling

The baseline data collection randomly sampled treatment and comparison schools. The endline data collection sampled from these same schools, however, due to Covid-19, time restrictions, and a caution of accessing too many schools unnecessarily, the evaluation team decided in communication with iMlango and the FM, not to visit all of the same schools. Initially, schools were clustered geographically for ease of data collection (i.e. to collect data from as many schools as the timeline would allow) and selected accordingly for endline data collection while employing similar sampling strategies and ratios for region and school type. In light of the pivot to remote data collection, data from comparison schools was removed and the 40 treatment schools were reduced to 32 for surveys with girls. (eight per region including four A/C schools and four B schools). A mixture of random and purposive sampling approaches were employed to enable a representative sample of schools across the four regions. Within the four regions, random sampling was used to select four A/C schools and four B schools (eight in total).

Out of these 32 schools, half were invited to participate in the qualitative data collection. All student and teacher interviews were conducted in the same half (i.e. 16 selected schools) in addition to administering the girls' survey. Within these 16 schools all headteacher and BoM member interviews were conducted in the same eight schools. It is considered that this approach allows for more internal triangulation while still enabling comparison between regions and is aligned with the midline methodology, which explored impact through the use of school case studies. This is also aligned with a cross-sectional approach to the research. The final school selection for the qualitative interventions was done randomly.

The decision to not include secondary schools in the endline data collection was made in conversation with the iMlango Evaluation Review group and the FM. The removal of transition as a focus, as well as the time restrictions and limitations in light of Covid-19 and the pivot to remote data collection meant that it was no longer possible to include them.

Student data sample

The study maintained a combination of quantitative and qualitative data from students. The quantitative data was gathered from the monitoring data provided by project partners, regarding attendance and learning content, and remotely collected via student surveys. Twelve students were identified randomly by Jigsaw staff in each of the 32 selected treatment schools

(8 per region). These names were provided to RDM for the enumerators to then contact when engaging with the schools. This equates to a total of 384 student surveys, which is considered to be an appropriate sample size to establish trends and relationships in the data, while allowing for freedom for in-depth statistical analysis.

Qualitative student data was collected through remote KIIs with one student in half (16) of the sampled treatment schools. This equated to four interviews per region (two in A/C schools and two in B schools in each region).

In total, 383 students were surveyed as some students selected for surveying were unavailable on the day of data collection and were replaced by other available students. They were all girls from the selected schools across four different counties. A breakdown of the demographics can be found in *Table 4 to 6*. As can be seen, the sample is equally distributed across counties and school types, with less balanced distribution across grades: 37% of students came from Standard 4 while only 1% and 8% were from S3 and S8. Due to the low number of students in S3, the grade was recoded to combine S3 and S4 (the new level was named 'Standard 3-4') in further quantitative analysis.

Table 5: Distribution of survey sample by county

County	Number of students surveyed	% of total
Kajiado	91	23.8%
Kilifi	97	25.3%
Makueni	96	25.1%
Uasin Gishu	99	25.8%

Table 6: Distribution of survey sample by type of school

Type of school	Number of students surveyed	% of total
A/C	193	50.4%
B	190	49.6%

Table 7: Distribution of survey sample by grade

Grade	Number of students surveyed	% of total
Standard 3	3	1%
Standard 4	140	37%

Standard 5	41	11%
Standard 6	71	19%
Standard 7	97	25%
Standard 8	30	8%

Teacher data sample

Qualitative teacher data was collected through remote KIIs with one teacher from each of the same 16 schools identified for the other qualitative data collection. Headteachers were asked to identify either a maths or English teacher for these interviews. This resulted in four interviews per region (two in A/C schools and two in B schools in each region).

School administration data sample

Qualitative data was collected from headteachers, BoM members, and local MoE representatives (i.e. CSOs or DEOs) through remote KIIs.

The headteacher, (or other school leadership member, where the headteacher was unavailable) of the eight schools randomly sampled by Jigsaw staff, was interviewed for qualitative data collection, two per region (one in an A/C school and one in a B school). The BoM members were identified by the Headteachers in the eight schools as individuals within the BoM that would be able to provide helpful insight for the evaluation.

Six local MoE representatives were interviewed to represent the different counties of project operation (i.e. one to two interviews were conducted for each county). Introductions to appropriate individuals were made by the iMlango team.

Project-level data sample

Qualitative data was collected from project-level key informants through in-depth interviews conducted remotely by the Jigsaw evaluation team. Sampling was purposive in conversation with the iMlango Evaluation Review Group. Interviews were requested with representatives from all relevant consortium partners to ensure full representation and an equitable distribution of voices. This included five operational Avanti staff, six operational sQuid staff and three operational WhizzEducation staff. In addition to this, senior managers in each of the main operational consortium members were interviewed - two for Whizz, one for Avanti and one for sQuid. In total, 18 interviews with project staff were completed ensuring a thorough examination of the key project learnings.

In addition, project-related background documentation was analysed including documentation regarding project costs for the value for money analysis, which was provided by the iMlango consortium.

Data collection tools

All data for the endline was collected remotely. Both the survey and key informant interviews with the students, teachers, headteachers, BoMs and MoE officials were conducted over the phone, by Research Development and Management Ltd (RDM), an in-country research team of Kenyan enumerators, and were all 25-30 minutes in length. The project level KIIs were conducted online by the UK-based Jigsaw research team and were 45-60 minutes in length.

The process of data collection and an overview of the tools used are outlined below. The detailed transcripts of each of the tools are included in Annex 10.

Quantitative data collection

The student survey targeted students in S3, S4, S5, S6, S7 and S8. There was one survey protocol, with skip logic woven throughout to enable specific lines of enquiry to be pursued where relevant. The student survey focused on the following areas:

- **Learning:** What learning are they doing (as in, what iMlango learning activities are they participating in and what skills are they developing)? How they feel they are doing in their learning. Exploration of learning conditions - confidence, self-esteem, support etc.
- **Barriers**: What and who supports them financially? What facilities do students have at home? Time spent doing chores. What stops them from attending? What stops them achieving/progressing?
- **Use of technology:** Use of computers at school/home, purpose of use, the impact on learning, use of Maths-Whizz/computer labs.
- **Aspirations and ambitions:** What do they want to do next year and why? Do they feel supported? Who makes decisions? How confident do they feel that they will get there? What is in place for that to happen?
- **Exploration of participation in specific activities:** Girls clubs, computer labs,
- **Teaching quality:** Classroom environment, support, teaching aids, gender pedagogy, etc
- **Covid-19:** Implications for their learning, support provided, access to resources

The survey was administered remotely using KoboCollect, with the enumerators speaking to the students on the phone. The surveys were designed to take between 30 and 35 minutes to complete. The survey template can be found in Annex 10.

Qualitative data collection

The design of the qualitative data collection tools was primarily led by the need to address research questions not covered in the student survey. The qualitative tools moved away from simply triangulating the quantitative findings, instead focusing on what the qualitative data could give that the quantitative data could not. The nature of the qualitative data collection tools allowed for the research questions to be explored in greater detail. Given the broader

context of the evaluation and the limited time available for the data collection, this was not able to be done sequentially.

The interviews with students, teachers, headteachers, BoM members and MoE officials were conducted over the phone by RDM, and were therefore designed to be 25-30 minutes in length. The project level KIIs were conducted by the UK-based Jigsaw research team online and were 45-60 minutes in length. Each template was designed around the research questions and targeted to the specific audience. The focus of each of the data collection tools is highlighted in *Table 7* below:

Table 8: Data collection tools and corresponding research questions

Tool	Key focus of the data collection tool	RQs
Student KIIs	Learning impact Teaching quality Barriers to learning Use of technology Aspirations and ambitions Covid-19: Implications for their learning	RQ1 (all) RQ2.1 RQ4 (all)
Teacher KIIs	The use of technology in school and the impact of this on learning and transition Teaching quality School governance Sustainability of activities Covid-19 adaptations and support to students	RQ1.5 RQ2 (all) RQ3.1 RQ4 (all)
Headteacher KIIs	The use of technology in school and the impact of this on learning and transition Teaching quality School governance Sustainability of activities Covid-19 adaptations and support to students	RQ1.5 RQ2 (all) RQ3.1 RQ4 (all)
BoM member KIIs	Student learning and transition Barriers to learning Teaching quality School governance Sustainability of activities Covid-19 adaptations and support to students	RQ1.1 RQ1.4 RQ2 (all) RQ3.1 RQ4 (all)
MoE representatives KIIs	Digital learning Teaching quality School governance Sustainability Scalability	RQ1.5 RQ2 (all) RQ3.1 RQ3.3 RQ4 (all)

	Covid-19 adaptations and support to students	
Project staff KIIs	Pupil learning and transition Teacher and school leadership practices Sustainability Value for Money Scalability Covid-19 adaptation and support to students and teachers	RQ1 (all) RQ2 (all) RQ3 (all) RQ4 (all)

The data collection templates were designed to capture rich data. Each contained 5-8 primary questions and following each primary question were 3-5 probing follow-up questions to help understand the reasons for the answer and encourage a depth of response. Audio recording on tablets was used, with consent, to ensure that the enumerators focused on leading the interview without being distracted by notetaking, and enabled them to capture all that was discussed during the interviews. This increased the accuracy of the transcription and the depth of the conversation.

All qualitative data collection transcripts can be found in Annex 10.

3.3 Approach to data analysis

Quantitative analysis

Once the data had been checked for outliers and inconsistencies, some variables were re-coded, as well as new variables created. Specifically, some ranked variables (including and beyond Likert scaled variables), were reverse coded to enable more intuitive analysis. Further, new variables were created to capture information not easier accessible in the original questions. An example of this is the 'disability' variable which allows the students with different (and sometimes multiple) disabilities to be compared across the dataset. A more detailed list of variables that were re-coded, and created, can be found in Annex 11.

After data cleaning, the survey data were explored through statistical analysis in R. The analysis can be roughly grouped into two categories: descriptive and inferential. Descriptive analysis was conducted on most of the questions in the survey to explore the frequencies with which each response was given. These frequencies were further disaggregated along grade, county, and type of school (where applicable) to explore the relationships between a response (such as 'Yes' or 'No') and these factors. The statistical significance (p) of the relationships explored in these disaggregated frequency tables–otherwise known as crosstabs-were tested using chi-square tests (an inferential test). The chi-square test statistic (X^2), alongside the p-value, therefore revealed whether the frequency of responses in the type of school that were considered (Type A/C and B) were the result of more than just chance. Other descriptives were also explored, as appropriate, to explain trends in the data. Most commonly, these included using measures of central tendency (namely the median and mean) to find the average (such as with 'Age').

The second category of analysis, inferential analysis, were predominantly conducted when there was a need to explore the relationship between one, or multiple 'predictor' variables (such as, for example, different types of iMlango activities) and an outcome variable (such as, for example, learning progress). At least one of the variables explored in these analyses tended to be continuous or ranked (such that a response can be ordered from high to low: e.g. 1st, 2nd, 3rd) as opposed to categorical (such that a response cannot be ordered: e.g. Male and Female). Various types of regression and correlation analysis were primarily employed, with the choice of which type of regression or correlation to conduct dependent on the types of data (e.g. categorical, ranked or continuous), combinations of types of data in the analysis and the statistical assumptions that needed to be met to allow for rigorous analysis.

A number of statistics are reported as part of the regression result. These include the beta values (β), or log odds (LO), alongside corresponding p-values, which are reported to explain the degree to which an outcome variable changes for every point change in a single predictor variable (positive values indicate positive correlations while negative values show negative correlations). The beta value provides detail on individual predictor variables within a model. Similar to β scores, odds ratios are also reported where relevant, along with the related p values. Notably, keeping with the standard practice within GEC evaluations, across all of the statistical tests conducted, p-values of 0.05 or less are considered as statistically significant, those between 0.05 and 0.07 are considered as marginally significant and those above 0.07 are not considered as significant.

Qualitative analysis

Thematic analysis was conducted on the transcriptions from the interviews, using a deductive and inductive qualitative coding approach in MaxQDA. An initial coding framework was developed around the evaluation questions, with further codes added inductively as themes arose during the analysis process. Document variables were created based on the sampling criteria. The qualitative coding framework is included in Annex 11. Prior to analysis, the detailed notes of each interview were cleaned and prepared for analysis in MaxQDA. Once the coding process was completed, analysis of the coded segments was conducted to identify areas of convergence and divergence within the data.

Project data analysis

Project data was provided by Avanti and consortium partners. All the data went through an initial scan for relevance and utility. Data was considered relevant if it contained data relating to the evaluation questions, or useful background information. Basic descriptive statistical analysis of the monitoring data was undertaken in Microsoft Excel, with trends and changes over the life of the project identified. Qualitative data was based on the documents' contents and did not go through a formal coding process. The findings from the project data analysis fed into the qualitative tool design.

Specific note should be taken of the analysis of KCPE (Kenya Certificate of Primary Education) data. Average KCPE scores were submitted by 28 of the 32 iMlango schools sampled for the endline evaluation across all four counties (Makueni, Kajiado, Kilifi, and Uasin Gishu). The data included average scores for all five KCPE subjects (English, Kiswahili, Maths, Science, and

Social Science and Religious Education (SSTR)), as well as average total scores from 2016 to 2020. The numbers of boys and girls taking the exam each year per school were also recorded (but no separate scores were available for each gender group, so there was no opportunity for disaggregation). Specifically, all 16 schools from Kilifi and Uasin Gishu (eight from each) and six each from the other two counties submitted data. This report only focuses on the analysis of literacy, numeracy and overall average scores. Based on the average scores and number of students from each school in each county, mean scores for English, maths and the cumulative score of all five KCPE subjects were calculated and analysed for each county.

Combining findings

After the monitoring data and primary data analysis was complete and findings identified, the findings were combined in a process of triangulation. Convergent findings and trends were identified and points of divergence identified and explored.

3.4 Challenges and limitations of the approach

While the endline methodology was appropriate and feasible to meet the evaluation purpose and the necessary ethical considerations, it is important to note the constraints and limitations of the approach. These were understood at the outset of the evaluation and discussed and agreed upon with both iMlango and the FM.

Firstly, the Covid-19 pandemic necessitated that endline data collection was conducted remotely, which has a number of associated challenges and limitations:

- Despite the support and coordination offered by the school teachers, remote data collection made recruiting participants more challenging and time-consuming than when done face-to-face during school visits.
- Remote data collection relies on the participants having access to technology to allow them to participate, as such there were challenges recruiting participants over the phone if they are using phones that do not belong to them. Enumerators reported difficulty with scheduling calls with participants, due to the availability of the caregivers or the contact person whose phones were being used.
- Remote data collection does not lend itself to certain qualitative data collection approaches and as such the evaluation was unable to include focus group discussions as planned, instead relying on semi-structured KIIs. This had the potential to limit the depth of insight through the qualitative interactions, however broad coverage through KIIs and thorough probing within interviews mitigated some of the potential loss.
- Remote data collection was also disrupted by poor connectivity. Enumerators reported that calls often dropped due to poor network and surveys and interviews had to be completed over a number of calls. Enumerators also liaised with schools to identify spots where call reception was stable and had students use the phone from that spot.
- Enumerators also reported that there were issues with the audibility of respondents talking on the phone, as it was not possible to control how respondents were holding

the handset. As such, enerumators reported issues hearing some of the respondents, understanding their answers and difficulty taking notes. The enumerators encouraged schools to brief students on how to hold phones or set up handsfree, and in some cases replacement phones were used.

- The data collection team identified that some students in the first few schools were being coached by teachers in their responses. This understandably would have interfered with the authenticity of the data and introduced an unhelpful bias. As a result, the data collection team engaged the Avanti field officers to reiterate the need for independence to the school management. Interviews were rescheduled when headteachers assured the enumerators that teachers were clear on expectations. In addition to this, older students were selected for interviews as this reduced the likelihood of teachers influencing their responses.
- Due to ethical considerations, remote data collection reduces the time available for each survey, meaning that the survey design is shorter, leaving less time to probe. As such, less data was collected than at the baseline evaluation point. However, enumerators reported that some of the qualitative tools were too long and that interviewees sometimes rushed answers, complained that there were too many questions and were tired or uninterested. This may have affected the quality of the data collected.
- Enumerators also had increased difficulty in establishing a personal connection and rapport with each participant over the phone. Because of the difficulty in building rapport with participants, particularly interviewees, and the limitations of data collection over the phone, there is the potential that the depth and richness of qualitative data collected is compromised, particularly with students.
- Enumerators reported challenges in finding the necessary participants for the qualitative data collection as outlined in the sampling criteria. As the enumerators could not visit schools to recruit students they were reliant on the support of headteachers and teachers to identify the students and facilitate contact with them. Additional schools had to be added to the qualitative sampling and additional interviews conducted in order to meet the sampling criteria.

Secondly, the revised approach introduced contribution analysis as the overarching analytical framework. This approach was agreed in conversation with the iMlango consortium and the FM and deemed appropriate for the broader context of the endline evaluation. Contribution analysis is a rigorous approach however in an ideal scenario it would be done in an iterative manner. This means that evidence should be repeatedly collected and analysed, and narratives gradually refined. Unfortunately, given the timeframe and budget restrictions of the endline evaluation, the iterative component of the approach was not implemented, in part limiting its strength. Time constraints and the availability of data also meant that the contribution analysis was unable to thoroughly address all aspects of the theory and change– specifically those aspects related to girls' literacy and numeracy outcomes. Whilst this key outcome was not ignored in the evaluation, constraints in collecting more learning data limited the depth of analysis that could be done.

Thirdly, whilst the contribution analysis incorporated a great deal of evidence from, and analysis of, primary data (surveys and interviews), there was less incorporation of data from

secondary sources. In-depth searches for and analysis of other projects' interventions, policy documents, academic and grey literature were limited due to time and budget constraints.

Fourthly, the changing context of Covid-19 restrictions affected the endline evaluation. For example, due to travel restrictions for Jigsaw, it was not possible for Jigsaw staff to conduct a face-to-face training course for the enumerators. An alternative approach was developed, involving RDM and Avanti meeting in person and Jigsaw staff delivering the training remotely. Most significantly, the endline data collection had to adapt to the changing nature of school closures, with permission not being granted to access schools in person and all data collection to be conducted remotely. There was also a limited time before school term closures and exams resulting in a small window for data collection with students.

Fifthly, some caution should be taken in interpreting the results of some of the statistical analyses due to the small sample sizes. Smaller effects, especially in disaggregated data, may have remained undetected because there were insufficient sample sizes in which to do so. As such, there is the chance that no statistical relationships were reported between variables, when indeed a small, though less detectable relationship, might have existed. Conversely, there is the risk that with small and less representative samples, that the statistically significant results that are found might be due to chance, or have a higher degree of associated error than might be the case with larger, more representative sample sizes. However, the nature of remote data collection, the Covid-19 context, data collection time restrictions and budget constraints meant that there was a limit on the number of key informant interviews that could be conducted; the decision was therefore made to focus on the small group of informants that would potentially give the most contextual insight.

Finally, a significant limitation of the endline evaluation is that it is not comparable with the baseline and midline evaluations due to the context within which it was conducted and the resulting constraints on data collection. The samples at endline are indicative and sampling had to be based on who was available and willing to participate in the research.

3.5 Research ethics

The endline evaluation prioritised research ethics and child protection in its methodological approach. The full ethical framework guiding the research is included in the Inception Report (Annex 9), including the child protection and safeguarding reporting procedure, research ethics framework, risk assessment framework and code of conduct.

In summary, the following actions were taken to protect the dignity, rights and welfare of all those involved in the research:

- The enumerator team had previously received detailed training on child protection and safeguarding in GEC-T evaluations, including how to recognise signs of abuse and understand reporting procedures. Before data collection the enumerator team received a thorough refresher training on safeguarding and how to report incidents and enumerators were required to sign the Code of Conduct prior to data collection to ensure appropriate behaviour throughout the data collection period.

- The enumerators were trained to conduct the data collection in a child-friendly manner, how to obtain informed consent, and how to respond to child protection disclosures. The enumerators were trained in how to encourage and calm the students such that they felt able to respond to the survey freely.
- Data collection was conducted in a child-friendly manner with students. This includes adequate time dedicated to rapport building. Before administering the survey and interviews, the enumerators explained the objectives of the study and how participants' information would be used. Participants were asked if they would like to participate and it was made clear that participants could choose to end the survey or interview without giving a reason.
- While names were collected to track students, enumerators made clear to participants that their name would not be reported and their individual answers will not be disclosed to anyone inside or outside the school, unless the child is identified as being at risk of harm. No individual's names will be used in the endline report and all datasets shared with the project and FM are anonymised.
- Existing iMlango and FM policies and procedures were adhered to regarding child protection, confidentiality, sensitive issues and referrals. The referral process for child protection concerns followed the iMlango procedure. No safeguarding concerns were raised during the period of data collection.

Chapter 4: Analysis - Impact of iMlango project activities

4.1 Introduction

This section presents findings related to the impact of iMlango project activities on learning (4.2) and transition (4.3), as well as the impact of the iMlango response to the 2020 Covid-19 school closures (4.4). At the conclusion of the chapter (4.5), the main findings are summarised and discussed according to the report's theoretical framework of contribution analysis. Findings in this section relate to the following research questions:

Table 9: Research questions related to project impact

RQs	
Research theme 1: Pupil learning and transition	
1.1	**Learning outcomes:** To what extent are numeracy and literacy learning level improvements seen? What are the key drivers and barriers to learning?
1.2	**Transition:** To what extent have the project interventions influenced girls' transitioning through key stages of education, training or employment?
1.3	**Additional benefits for learners:** What other forms of learning has the project contributed to? (E.g. life skills, gender equality, knowledge of Sexual and Reproductive Health and Rights, resilience).
1.4	**Enrolment and attendance:** What difference has iMlango made to enable marginalised girls to enrol in primary/secondary school and to frequently attend school? What has re-enrolment looked like in iMlango schools?
1.5	**Technology:** What do the literacy content and Maths-Whizz tutor add to the learning in the classroom? Do they support learners to develop their understanding of literacy and numeracy in ways that are not possible in their ordinary classroom?
Research theme 2: Teacher and school leadership practices	
2.1	**Teaching quality:** To what extent has the project been successful at improving the quality of teaching in targeted schools? What factors have contributed to or hindered this?
2.2	**School governance:** How has school governance improved at the school and county level as a result of iMlango? Do headteachers promote and monitor inclusive student centred learning techniques and gender equity at the school? To what extent has the project influenced sub-county/county-level systems?

Research theme 4: Project design and delivery	
4.1	**Covid-19 response:** How successfully has iMlango adapted its activities to respond to the impact of the Covid-19 pandemic? What is the impact of the app usage for active users? What barriers exist to using and engaging with the app? To what extent have the activities conducted during the crisis (teacher training, TLM dissemination) solidified the benefits of iMlango? How, why and to what extent have teachers been engaged in remote learning strategies during the Covid-19 period? How successfully has the project supported the continuous professional development of teachers during school closures?

In exploring the above research questions, the chapter provides a platform from which to assess the assumptions of the project's Theory of Change. This is, in summary, that project activities (such as the iMlango portal and content, attendance monitoring system and girls clubs) will have led to positive learning and transition outcomes.

Due to the Covid-19 school closures, the majority of original project activities were significantly disrupted throughout the last year. Similarly, for this evaluation, the opportunity for in-person data collection was limited. As a result, it was not possible to conduct a large-scale assessment of learning outcomes in the manner originally conceived in the GEC evaluation framework. However, relevant findings related to the perceived impact of original project activities (as outlined in Chapter 3) are included. It is worth re-stating here that the self-reported nature of the findings relating to learning outcomes is a significant limitation. However, in the sub-optimal circumstances, it still provides an indication of changes which took place.

4.2 Impact of project activities on learning

This section presents the findings regarding the impact the iMlango project has had on student learning, including literacy and numeracy, teaching quality, governance, school attendance and enrolment, technology, life skills and project design and delivery of outcomes.

4.2.1 Literacy and numeracy

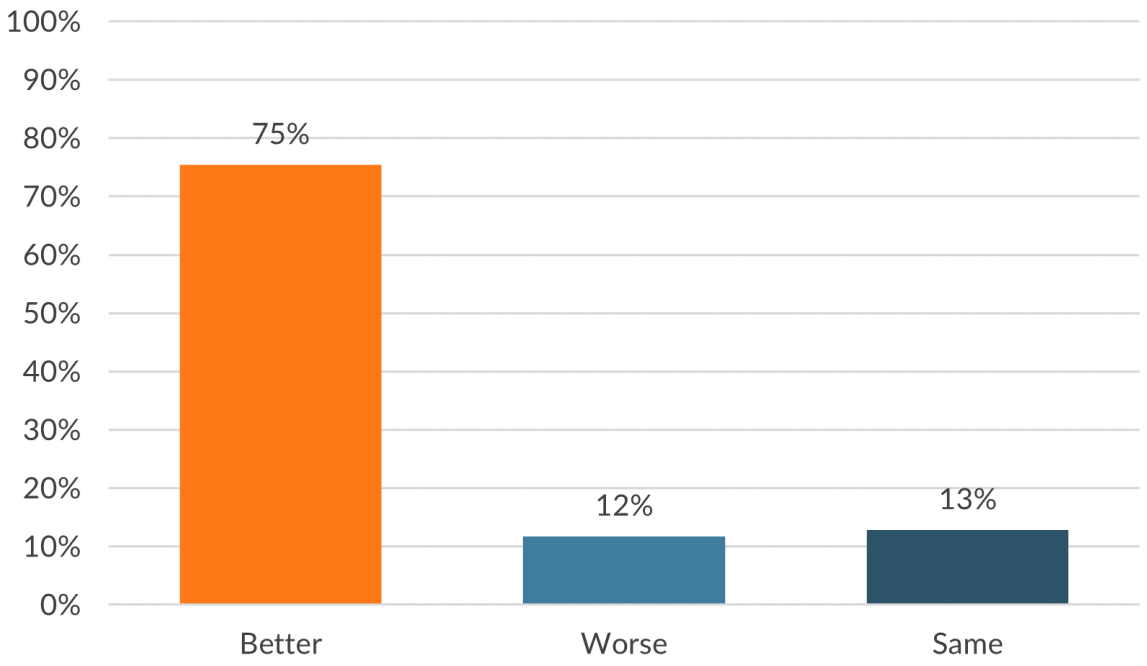
This section outlines the impact of project activities on students' academic performance, particularly in literacy and numeracy. Firstly, the self-reported learning gains are presented, followed by the specific gains achieved by girls. The section then goes on to outline the factors which contributed to these perceived gains, which are further explored in subsequent sub-sections. Finally, the section presents the other contributing factors which were reported to have impacted upon learning outcomes.

Learning gains

Student surveys provided self-reported evidence that, despite the disruption to schooling caused by Covid-19, there have been perceived learning gains at iMlango schools. When asked

about their general academic progress compared to the previous year (2020), 75% (289 of 383 students surveyed) reported they that they were doing better in their school work in early 2021, while 13% (49 of 383) reported no improvement and 12% (45 of 383) identified that they were doing worse than the previous year (*Figure 2*). These reported learning gains were echoed in the key informant interviews (KIIs). In these, six interviewees stated that iMlango students were performing above average, especially compared to other schools in their local area (2 HTs, 2 MoE, 1 BoM, 1 student).

Figure 2: Student survey responses to the question 'Compared to the last school year, how do you think you are doing in your school work?'



Total number of respondents: 383

When considering subject-specific learning outcomes, respondents consistently stated that the iMlango programme had led to overall learning improvements in literacy (2 HTs, 4 MoE, 9 teachers, 4 PS). Furthermore, nine interviewees articulated that iMlango had led to improvements in reading (1 HT, 2 MoE, 5 teachers, 1 PS), and two teachers explained that students are now able to read and comprehend at earlier Grade levels than before (specifically, by Grade 4 and Grade 6, which the teachers explained used not to be the case in their respective schools). More details about the impact of the literacy content on learning can be found in section 4.2.2. One MoE official and one teacher also evidenced that these specific improvements had enhanced performances in exams, arguing that students are now higher performance in national assessment exams and that post-Covid exams have shown clear English improvements.

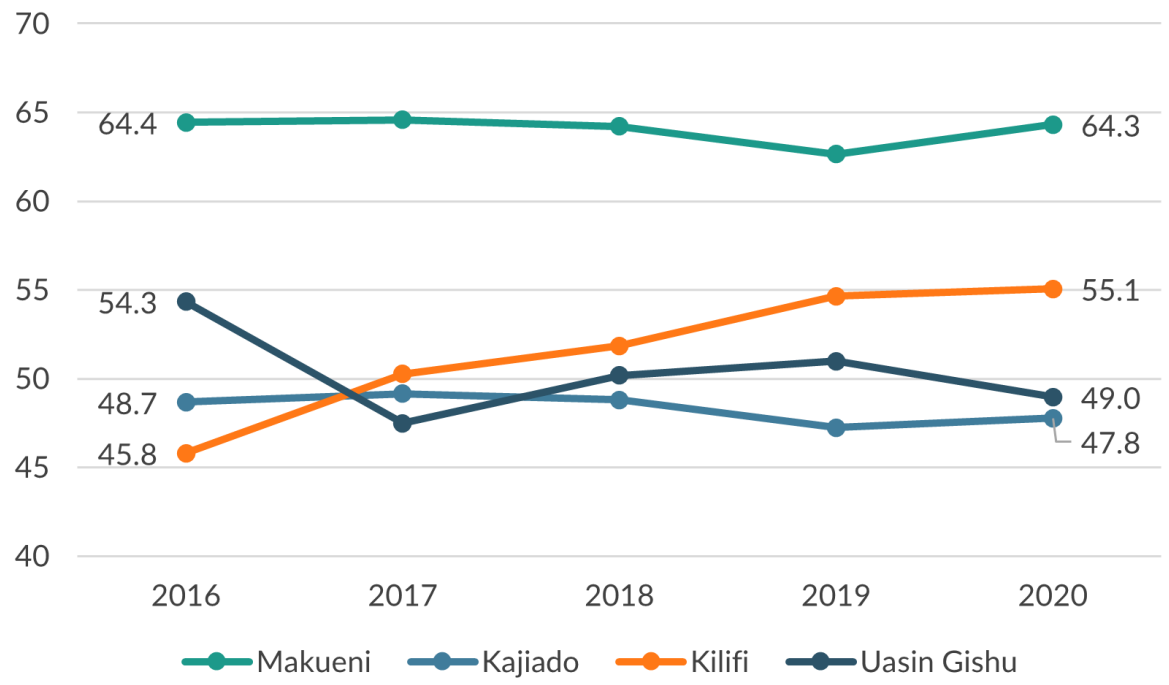
Similarly, there was an overarching response that iMlango had significantly contributed to improving learning outcomes for numeracy (1 HT, 3 MoE, 3 students, 4 teachers, 2 PS). Three teachers and one headteacher expressed that this had resulted in higher maths scores. Indeed, one teacher reported that iMlango schools are coming out in the top positions in numeracy

results compared to other local schools. One teacher and one MoE official also reported that average maths scores have increased as a result of iMlango. The MoE official explained that average scores had been in the 50s, but were now between 64 and 67, whilst the teacher reported an increase from between the 20s/30s to the 40s/50s.

This self-reported data, however, does not directly triangulate with data obtained from the schools' Kenya Certificate of Primary Education (KCPE) results (see Section 3.3 for the sampling and analysis approach of KCPE data). As displayed in *Figures 3 and 4*, KCPE scores appear to have varied widely across the four counties: some iMlango schools experienced significant improvements, while others displayed little change and even a decline in average scores between 2016 and 2020 (scores for each subject are out of 100). Different subjects also showed variation: for some schools, the trend of improvement/decline could be seen in both English and maths while others showed unequal improvement/decline in these subjects.

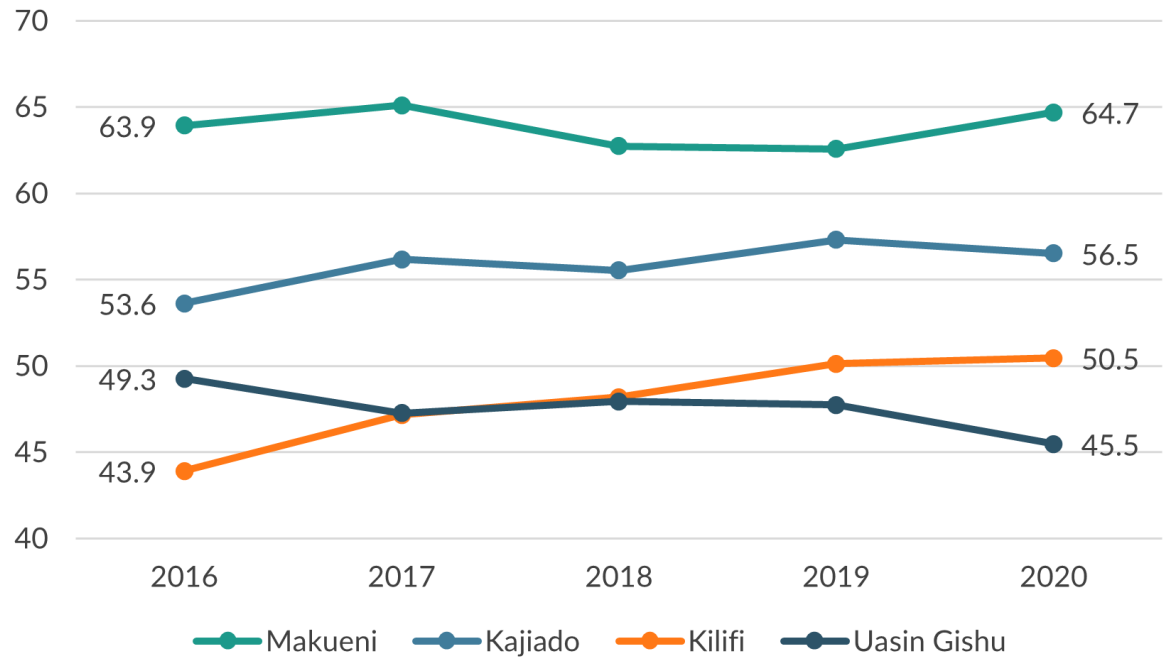
Overall, students from Makueni generally achieved higher results than those from the other three counties (a finding which may potentially be linked to its peri-urban status), however schools in this county only experienced a small mean improvement in English. Kilifi, on the other hand, showed the most significant change in KCPE results during this period, averaging an improvement of 8.08 for maths and 5.88 for English across the sampled schools. Kajiado showed improvement in English, but not in Maths; however, there was fluctuation in the scores from Uasin Gishu, with an overall decrease in both subjects between 2016 and 2020.

Figure 3: Average maths KCPE scores by county (2016-2020)



Total number of schools: 6 (Makueni); 6 (Kajiado); 8 (Kilifi); 8 Uasin Gishu

Figure 4: Average English KCPE scores by county (2016-2020)



Total number of schools: 6 (Makueni); 6 (Kajiado); 8 (Kilifi); 8 Uasin Gishu

These findings contrast with the endline student survey, where no statistically significant differences were found across the four different counties. The two sets of data are not directly comparable, due to the self-reported nature of the survey and the fact that students were asked about their progress from the last academic year (2020) to the point of the survey (February/March 2021), which were not covered by the KCPE data; however, the lack of statistical difference is surprising considering the level of variation between counties in KCPE results.

With respect to other key demographic factors (grade and school type) in the student survey, Standard 8 students self-reported to be doing better at school than those from any other grade (Standard 3 to 4, 5, 6, and 7 respectively) (log odds = 0.127, 0.069, 0.0799, and 0.074, $p < 0.05$ for all comparisons), which, as the highest Grade, could be a reflection of their having received more years of teaching, or perhaps the fact that schools re-opened earlier for this year group . Students from Type A/C schools (where iMlango ICT labs were established) also showed a trend of improved learning outcomes, but this trend is not statistically significant (log odds = 1.417, $p = 0.157$).

It should be noted that the Covid-19 school closures negatively impacted upon learning, and that Whizz Education found evidence of learning loss during this period. Further details are provided in Section 4.4.4.

Impact on girls' learning outcomes

The KIIs revealed a noteworthy demographic trend related to the gendered nature of learning outcomes. There was consensus among teaching staff that iMlango had caused a greater impact on girls' performance than boys', due to the project's specific focus on girls (3 HTs, 5

teachers). One teacher elaborated that they began to notice these improvements after two years..

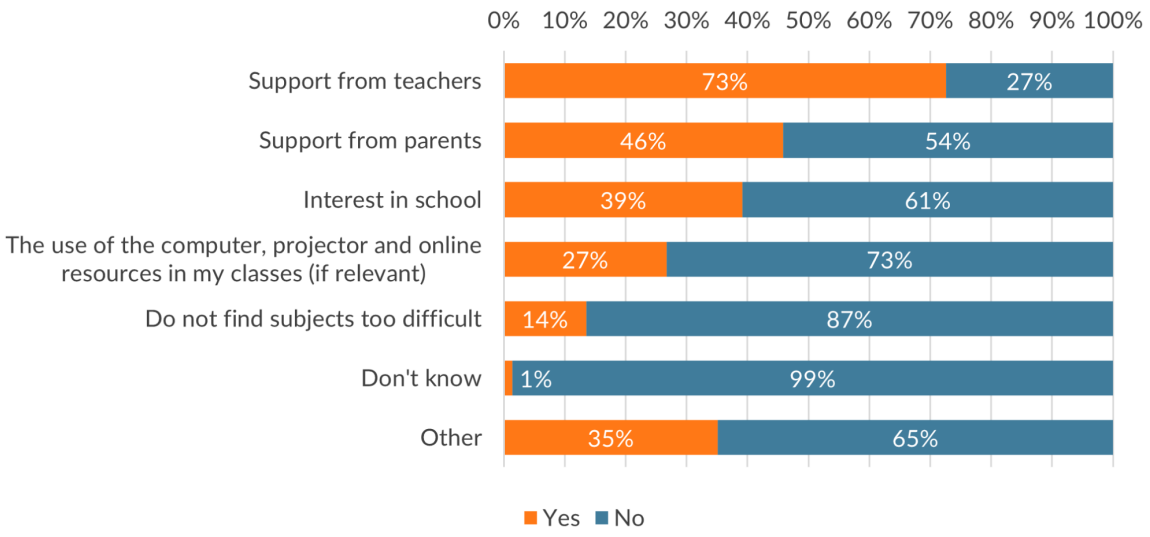
However, there was more debate as to whether girls had surpassed boys in terms of learning outcomes. Six respondents stated that this had been the case, arguing that the iMlango project had resulted in girls performing better than boys during school (2 HTs, 4 teachers). Four of these respondents specifically referenced project activities (including the girls clubs, attendance monitoring, and the project's general focus on girls) as reasons for this; three mentioned external contributing factors (including the provision of sanitary pads allowing girls to attend school and thus improve, that boys are generally older than girls, and thus less interested in learning, and that women's position of responsibility in the household was reflected in girls being more engaged in school). Two teachers additionally reported that the majority of top learners in each class are now girls, with one headteacher and one teacher expressing that boys have become withdrawn and left behind by iMlango. However, the idea that boys were actively excluded from the project was a minority view. In contrast, five teachers expressed that the programme was focused on both boys and girls, who were now performing equally. Two teachers identified that the extra support given to girls helped stimulate healthy competition within the classroom. Two headteachers supported this view by articulating that both boys and girls had access to iMlango and its content. One teacher further reported that, without supervision, boys would always find ways to access computer labs more than girls (for example, through hiding equipment). Significantly, no interviewees reported specifically that girls remain behind boys in iMlango schools.

Among project staff there was little discussion of differences in learning outcomes between boys and girls. When it was mentioned, one staff member reported that at the beginning of the project, in most cases boys were accessing the portal more than girls. In response, gender balance aspects were introduced to lessons, and teachers were encouraged to take more control. This led to greater success in ensuring equal portal access between boys and girls. Other learning outcomes were mentioned specifically for girls. One staff member articulated that designating girls as computer champions improved their confidence. This helped to overcome technophobia and led to learning improvements in both literacy and numeracy.

Key drivers to learning

The survey and interviews both highlighted overlapping factors which were found to have contributed to the overall improvement in learning. Amongst survey responses, the key drivers for improvement in school work included: support from teachers (73%, or 209 students), support from parents (46%/132), students' own interest in school (40%/113), the use of technology in class (27%/77), and easy school subjects (14%/39) (see *Figure 5* for more information).

Figure 5: Student survey responses to the question 'Why do you think you are doing better in your school work?'



Total number of respondents: 288

This was echoed in the KIIs, where three main themes related to learning factors arose from the data. Firstly, the provision of technology and hardware in schools through iMlango was viewed as improving and contributing positively to learning outcomes (3 BoM, 9 students, 10 teachers, 9 PS). Secondly, iMlango was seen to have benefited teachers and teaching quality, which cemented learning improvements (3 teachers, 3 students, 3 PS). Thirdly, the provision of iMlango learning content and other classroom activities were reported to have improved learning outcomes: eight participants stated that Maths-Whizz content supported learning improvements (1 HT, 1 MoE, 1 student, 5 teachers) and 4 teachers stated that literacy content had led to improvements in reading. All three factors are explored in detail later in the analysis, technology in chapter 4.2.2, teaching quality in chapter 4.2.3, and barriers to learning in chapter 5.2.

Student Case Study

Name: Deborah
County: Kilifi County

Deborah lives with her parents in the Kilifi County Township and attends primary school. She has three siblings, two brothers and one sister, who all attend the same school.

Deborah's father is a teacher within Kilifi Town and her mother sells vegetables in the local market whilst also looking after the family and their home. Deborah also supports her parents in taking responsibility for some of

the chores at home such as cooking and cleaning and taking care of her younger siblings.

Deborah joined her primary school in 2014 and she has enjoyed her time there. She sometimes feels overburdened by the responsibilities at home in addition to the school work, but continues to love learning. She does feel as though her performance at school has not been improving lately as a result of the additional responsibilities at home, and hopes to discuss this with her parents so that she can concentrate on her studies.

Deborah's school is one of the primary and secondary schools supported by the iMlango project, funded by UK aid through the Girls' Education Challenge. One of the interventions has been the introduction of a computer lab and additional digital devices for whole class teaching. From the day Deborah first sat at a computer, there is nothing she enjoys more than working on a computer and learning how to use them in her studies. She loves reading stories and other materials on the computer, learning maths and practicing her typing skills.

When speaking with her, she indicated that she has not used computers over the past month or two due to COVID-19 restrictions, but clearly prefers lessons taught using a laptop and projector. She feels that computers make learning more interesting and help her to more quickly understand the different topics being taught.

Additional learning factors

The survey results indicated household factors to be a contributing factor to learning outcomes. Students coming from a family whose head of household was highly educated (tertiary level) are more likely to have improved in contrast with those whose caregivers received no formal education (odds ratio = 4.956, p = 0.014). Perhaps surprisingly, students who feared a lack of money would force them to drop out were also more likely to have reported an improvement in school work (odds ratio = 1.82, p = 0.025). School staff also referenced household factors in interviews, citing parental engagement as a key learning factor, especially in terms of student motivation (2 teachers, 1 HT). Factors which hindered learning, on the other hand, are discussed in Chapter 5.2.

Beyond iMlango activities, the most mentioned contribution to learning was the Tusome programme: a USAID funded, government programme which promotes literacy via e-learning (mentioned by 2 teachers, 1 headteacher and 1 MoE official). Beyond this, four other programmes were referenced by individual interviewees as impacting on learning:

- DLP: a government project, providing laptops in primary schools (1)
- EGMA: an early grade mathematics programme (1)
- ADC: the provision of a range of books (1)
- Solid Rock: an organisation facilitating learning via computers (1)

4.2.2 Technology

The introduction of ICT into schools was a core component of the iMlango project and a contributing factor to learning outcomes and teaching quality (as discussed in chapters 4.2.1 and 4.2.3). This section presents the level of access and usage to ICT, before outlining the impact of the hardware and digital learning content. Additional attention is given to the impact of creating ICT champions, the relative benefits of ICT for children with disabilities, and other contributing factors to technology in iMlango schools.

ICT accessibility and usage

In general, students reported to have had good access to iMlango computer labs: 81% of students (157) stated that they can access the ICT lab regularly while only 16% (31) students disagreed. However, accessing the lab appears to have been a challenge for those from higher grades, as half of the S8 students (11) disagreed that they could access the lab regularly. One possible explanation for this is that S8 students are encouraged to focus on revision for national exams, as opposed to being taken to the computer lab by teachers. In terms of computer use, 79% (303) of students reported to have used a computer at school. Notably, 40% of the remaining students (those who have not used computers) said that only teachers use computers at their school - all but one were from Type B schools. Other reasons include a lack of electricity/internet access (19%), not knowing how to use a computer (8%), lack of interest and lack of computers at school (6% for both). Further details about a reported lack of access to electricity and internet are provided in Section 5.2.3.

School type was also a significant factor: 95% (183) of students from Type A/C schools (those with computer labs) were found to have access to a computer at school, versus 63% (120) from Type B schools. The difference is statistically significant (X^2= 56.179, df = 1, $p < 0.001$), and a logical finding, considering that the project design did not include the provision of computer labs for students at Type B schools. The main reason for the lack of access to computers for Type A/C school students was a lack of power/internet (40%) while that for B school students was that only the teachers use computers (44%). More about challenges to ICT access (including connectivity challenges) can be found in Chapter 5.2.

Of students from Type A/C schools, 54% (105 of 193 students) reported having accessed the Maths-Whizz tutor in the previous month. Out of these students, 90% (95) claimed to have used the tutor for more than 30 minutes at least once, while 51% (54) used it every week, suggesting a relatively high usage rate from the students in general. Moreover, a trend suggested that those from higher grades used the tutor more frequently than younger students: 100% (5) of the S8 students used the Maths-Whizz tutor weekly while less than 60% of all other age groups used it weekly (however, due to the low frequencies, it is not possible to confirm the trend statistically). It is worth noting, however, that usage appears to have reduced from midline: Maths-Whizz data indicated that 71% of students accessed the portal each week between June 2019 to February 2020. There is no clear reason for this apparent reduction, although social distancing measures and other school-based decisions (following the reopening of schools post Covid-19) may have been a contributing factor.

Impact of technology hardware

The survey indicated the positive impact of the computer labs on learning. Firstly, it seems to have motivated students: all students surveyed agreed that they are excited when they get to use the lab. This is noteworthy, particularly considering that the labs have been in place for several years: the excitement has remained even though students are used to the presence of the lab within the school.

The KII findings add nuance and detail to the survey findings. As referred to earlier in chapter 4.2.1, 31 interviewees identified the provision of technology and hardware in schools through iMlango as contributing positively to learning outcomes (3 BoM, 9 students, 10 teachers, 9 PS). Although there were multiple reasons cited for this contribution, two main themes emerged. Firstly, as articulated by twelve respondents, children became excited to use the technology and attend learning, which increased their interest in the lessons using ICT (9 teachers, 3 MoE). This was summarised by one teacher, who articulated that:

> *The ICT integration makes learners interested to learn, hence high concentration and ultimately understanding more than in [a] normal board and chalk lesson. (Teacher, KII).*

A similar theme emerged among project staff interviews, nine of whom argued that the introduction of technology to schools made learning more interesting and engaging for students, leading to learning improvements. Six project staff members particularly identified that pupils enjoy lessons using technology, and even those in the most remote schools were excited to handle gadgets. A further four project staff indicated all iMlango students, even those most marginalised, have experienced large increases in digital literacy as a result of the project. One project staff member summarised:

> *Without a doubt the introduction of computers to schools has been impactful, because looking back into our society, even when we were growing up ourselves, the schools we went to, public schools that are marginalised … children did not get a chance to interact with computers. The message from the children is that it's given them a great opportunity to interact with computers, and all that can be done through them, is a great milestone and helps them to open their views and understanding. (iMlango staff, KII).*

Secondly, the ability of students to become digitally literate was a key reported benefit, particularly when comparing students at iMlango schools to their peers at non-iMlango schools. Seventeen participants made this comparison, particularly noting the benefits of having digital literacy (5 headteachers, 4 BoM members, 4 MoE officials, 1 student, 1 teacher, and 2 project staff members). Indeed, one headteacher stated that iMlango students *"gain more knowledge about what happens in the outside world" (Headteacher, KII)* than their peers, due to the ability to access the Internet and learn in the computer lab. Significantly, one staff member outlined that students who transfer into iMlango schools are initially technophobic due to their relative lack of skills in using technology, but that they adapt quickly to be able to utilise the resources.

It should also be noted that several teachers mentioned that the benefits of technology were not always available, with a number of factors limiting engagement with iMlango: more details are available in Chapter 5.2.

Impact of online literacy content

Beyond technology hardware, the digital learning content provided by iMlango was discussed in both the surveys and interviews and was generally reported to have impacted positively on classroom learning. Beginning first with the online literacy content, two key themes emerged: firstly, that the literacy content was considered to have led to improved learning outcomes across a range of areas; and secondly, that students were reported to have an overarching enjoyment of literacy content.

Firstly, the iMlango content was reported to have had a positive impact on literacy outcomes. 83% (160) of the students surveyed believed that online literacy tests have directly contributed to their improvements, while 11% (21) students disagreed. No significant difference was found for literacy scores across the disaggregating factors of school grade and county (school type was excluded, as only type A/C schools have ICT labs). However, ordinal logistic regressions confirmed that students who used computers frequently (as opposed to non-users) were found to be more likely to attribute an increase in literacy scores to the literacy tests ($p = 0.004$). It is also worth highlighting the fact that project data shows iMlango to have exceeded its target of 30% of primary girls (and boys) achieving 25 minutes of literacy content usage per active teaching week during term time, achieving 51% and 53% of girls/boys respectively for Year 4 to Year End 2021 (April 2020-March 2021). [NB. Jigsaw has been unable to corroborate the findings of this analysis, due to a lack of available data.]

Table 10: Correlations between literacy score improvement and technology use

Factor	Correlating factor	
	Computer use	Computer use (frequency)
Literacy score improvement	Positive trend	Positive (frequent)
	LO =1.211; p = 0.102 (n.s)	LO = 1.827; p = 0.004

Specifically, the literacy component received positive feedback in the KIIs. Two MoE officials highlighted that the content was deemed suitable for children's level of literacy and promoted students' digital literacy in the meantime. This was illustrated by two students who agreed that they would read stories on the platform when they had time and the literacy content was helpful. Moreover, one MoE official pointed out that the content had also provided teachers with additional teaching resources and six teachers voiced similar opinions and stated that they found the content varied, well-structured and concise. Overall, interview respondents also articulated seven key areas of students' learning that were impacted by iMlango literacy content: reading, writing, digital literacy, spoken English, grammar, listening, and teaching practices.

The second main theme to emerge from the data is that iMlango literacy content increased student engagement and enjoyment of literacy which led to learning improvements. Thirteen of the fifteen students interviewed (along with one headteacher and two MoE officials) stated that they enjoy literacy and are excited by the online literacy content delivered by iMlango.

One headteacher and two teachers also reported that iMlango content had increased students' motivation towards learning literacy, with one MoE official also commenting on students' eagerness to use the lab outside of lesson time. In addition, two students and two teachers articulated that the use of technology provided by iMlango was specifically enjoyable for literacy learning. The reasons cited for this were because: it broke the boredom of textbooks (1), learners could see clearly on the projector (1), and it helped teach students how to use technology (1).

Impact of online numeracy content

The iMlango digital content for numeracy, provided by Whizz Education, was also considered to have had a positive impact on student learning outcomes. Again, two main themes emerged: the impact on maths performance and the impact on student enjoyment.

Survey findings indicate positive attitudes towards Maths-Whizz content. 86% (165) students agreed the Maths-Whizztutor has helped them to learn maths, while 6% (11) disagreed with the statement. Furthermore, 82% (158) students attributed an improvement in their maths grades to the Maths-Whizz tutor, while 8% (16) disagreed. No significant difference was found for maths scores across the disaggregating factors of school grade and county (school type was excluded, as only type A/C schools have ICT labs). However, ordinal logistic regressions confirmed that students who used computers are more likely to attribute their improvement in maths scores to the tutor (LO = 1.747, p =0.024). Similarly, the use of the Maths-Whizz tutor in the previous month (Odds ratio = 2.542, p = 0.012) increased the odds of students reporting to have improved in school work.

Data provided by Whizz Education also suggests that the Maths-Whizz learning content improved the ability of students to catch-up to the international standard Maths Age. [NB. Jigsaw has been unable to corroborate the findings of this analysis which was conducted by Whizz Education, due to limited time to access the historical data.] When students used Maths-Whizz content for learning catch-up, students were reported to have an annual progression rate of 1.47 in the first year of implementation, based on Whizz Education's observed figures. Accelerated learning in subsequent years is expected, but not to the same extent - a depreciation factor of 0.9 is introduced to account for a decline of 10% in learning rates, year on year. In contrast, the standard progression rate is assumed to be 0.58 up to Grade 7 (the figure is taken from a previous baseline study of over 25,000 iMlango students in 2016, as an average rate at which iMlango primary school students' Maths Ages progress without access to Maths-Whizz). Since limited data on expected rates of progress in secondary is available, a Progress Rate of 1 between Grades 7 and 8 was used. Incoming Grade 8 students are expected to have a Maths Age of 13 (according to international standards).

Table 11 outlines Whizz Education's estimated impact of using Maths-Whizz content for numeracy catch-up. It is anticipated that Grade 4 students who have used Maths-Whizz content will catch up to the international standard Maths Age of 13 by Y4, while those without access to the content will only have reached the age of 9.91 - over three years behind the international standard. Indeed, using the assumed progress rate of 0.58, it would take 8 years for this cohort to reach 12.23 - almost half the time of those with access to Maths-Whizz.

Table 11: Comparison of student Maths Age with and without access to Maths-Whizz

With Maths-Whizz	Year/Grade	Y0	Y1	Y2	Y3	Y4
	Grade 4	7.17	8.64	9.96	11.29	**12.61**
	Grade 5	7.63	9.1	10.42	**11.75**	
	Grade 6	8.25	9.72	**11.04**		
	Grade 7	9.13	**10.6**			
	Grade 8	**10.23**				
Without Maths-Whizz	**Year/Grade**	**Y0**	**Y1**	**Y2**	**Y3**	**Y4**
	Grade 4	7.17	7.75	8.33	8.91	**9.91**
	Grade 5	7.63	8.21	8.79	**9.79**	
	Grade 6	8.25	8.83	**9.83**		
	Grade 7	9.13	**10.13**			
	Grade 8	**1.230**				

Eight KII participants also agreed that Maths-Whizz had helped to improve the students' numeracy skills (5 teachers, 1 HT, 1 MoE official, 1 student). There were no particular themes which emerged related to particular elements of the project which supported learning; instead, a range of aspects were mentioned, as follows:

- Students could access Maths-Whizz content in order to better understand or prepare for lessons (2 students, 1 teacher)
- Maths-Whizz provided individualised learning allowing all students enrolled in iMlango schools to progress their numeracy knowledge at the appropriate level (1 teacher, 2 PS)
- The quality of the content (2 PS)
- Maths-Whizz was designed to meet user needs, for example that a Kiswahili version was developed as an alternative option for children in grades 1-3. This ensured all students, particularly those in rural areas, could confidently engage with the numeracy content (1 PS)
- Students could look for information within ICT lab lessons to clarify questions originating from normal maths lessons (1 student)
- The digital devices helped learners retain knowledge more effectively (one teacher)

In interviews with project staff, the implementation of Maths-Whizz at a classroom level was further cited as a success for three main reasons: staff had a full understanding of the content and could properly prepare learners and schools to use it (1 PS), its core topics were relevant

to the curriculum (1 PS), and headteachers were engaged to discuss how they could implement Maths-Whizzinto daily school life (1 PS).

Secondly, student surveys and interviews reflected the impact on numeracy content on student enjoyment and engagement. The correlation between Maths-Whizz's help on maths grades and students' excitement for the use of technology in the classroom (e.g. the use of a projector or a computer) is positive but not significant, however, students who are excited about tech in the classroom tend to agree that the literacy tests have helped them with their literacy scores (LO = 2.059, p= 0.046). In KIIs, 12 students identified maths as one of their favourite subjects, with 7 of these students articulating specifically that they enjoyed maths lessons. Three main reasons were identified for this level of enjoyment: the accessibility of the content (2), being taught well (2) and the practical application of maths, in the context of using money and shopping (2). Moreover, one teacher expressed that local students who have left school to go to secondary school or even university sometimes come back to schools to use the computer labs, indicating the level of engagement and enjoyment towards Maths-Whizz content.

ICT champions and technical support

KIIs indicate that the initiative to establish ICT champions within iMlango schools has had a positive impact. Nine interviewees in total referred to the contributions of ICT champions in their interviews (4 HTs, 1 teacher, 3 PS, 1 BoM). These contributions ranged from providing ICT support in the school (3), training others on how to use ICT (3), speaking to parents and the community about ICT (1), mentoring their peers to help overcome challenges (1), and helping to develop life skills in school (1). One project staff member articulated that these additional responsibilities helped improve girls' confidence and learning. In spite of these positive statements, it was interesting to note that no students referenced ICT champions in their interviews.

Interview participants also noted the importance of the technical training and support they had received from iMlango, much of which is outlined in subchapter 4.2.3. Other participants also spoke of their engagement with iMlango staff: one student and one teacher said that students were motivated in their learning by the encouragement of field officers, whilst two BoM members reported having a positive working relationship with iMlango staff. One HT also mentioned that the equipment brought by the team for the training always helped with the smooth running of the sessions.

Children with disabilities

The impact of iMlango activities for children with disabilities (CwD) should also be noted. In several cases, schools were said to have specialised teachers or units working with CwD on developing general learning skills and other basic and special skills (e.g. agriculture). Some schools integrated CwD into lessons while others taught them separately from other students (2 teachers). One teacher described how ICT enabled inclusive assessment at their school:

> *[W]ith the ICT integration, they have improved a lot. [...] with ICT, it's [for] the learner to look at what is being shown on the screen, to get them all to answer the question and then [for the*

teachers] to mark, now with that, there is nobody they are listening to [...] so there is no big problem when it comes to how we use the computers, because [we] have trained them [to use] like the normal, the basic things, so with that I can tell you they have improved with the numeracy and with the literacy. And we say thank you for that. (Teacher, KII).

Beyond the impact of ICT for CwD, the survey and KIIs provided three other main findings relating to the impact of iMlango activities. Firstly, disability was found to be a significant barrier for reported learning progression: this is outlined in detail in Section 5.2.1. Conversely, disability was found to have a positive correlation with the self-reported aspiration to continue studying, as is outlined in 4.3.1. Finally, the creation of an inclusive learning environment through teaching practices is explored 4.2.3.

Additional technology initiatives

Besides the devices and digital content provided by iMlango, KII respondents referenced other technological contributions that have helped their school to make progress - in particular, government-provided technology. Two participants referred to government laptops, whilst two other teachers mentioned government tablets. These devices appear to have been provided after the start of the iMlango project, and are used to facilitate teaching and learning. One teacher stated that she uses the laptops to teach older students via the Internet, who do not otherwise have relevant content from iMlango activities; another stated that the students are able to borrow government tablets and read independently on them. Furthering these comments, four project staff mentioned that iMlango was able to use technology hardware that had already been provided to primary schools by the Kenyan government. Two project staff members detailed that each primary school received around 100 tablets and 10 teacher laptops as part of the DLP programme. Four project staff members indicated that these devices were used to access learning content delivered through iMlango. One staff member also indicated specifically that accessing Maths-Whizz content through these devices was actively encouraged, especially when computer labs broke down. More on the potential alignment of these contributions with iMlango activities can be found in Chapter 8.2.

4.2.3 Teaching quality

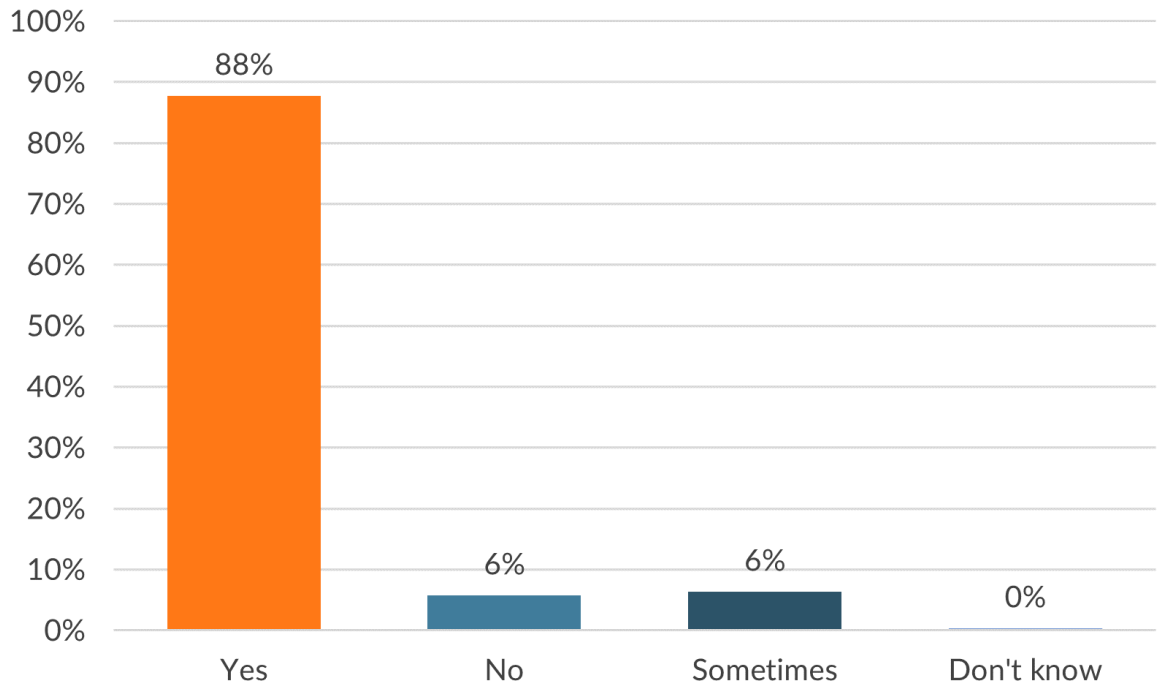
Building on the impact that iMlango activities had on learning outcomes and the broader impact of technology for iMlango schools, this section outlines the project's impact on teaching quality. Firstly, changes to teaching over the course of the iMlango project are presented, as observed by project participants and staff. The section then transitions to consider the impact of ICT on teaching, as well as the impact of training. Finally, the relationship between teaching and gender equality is explored, in addition to other observed contributing factors.

Observed quality of and changes to teaching

In general, survey results suggested that students hold positive attitudes towards teaching quality in their schools. Almost all of the 383 students surveyed claimed to feel welcome in class (99%; or 380). Moreover, teaching was largely viewed to be responsive to student needs. Most students responded that teachers would always switch to a different language if necessary to help them understand (88%, 336), and only a minority saying their teachers would

only do this occasionally (6%) or not at all (6%) (*Figure 6*). School type has a marginal effect on the question on whether teachers switch languages in class: those from Type A/C schools are more likely to agree that their teachers do so more frequently (Log Odds = 0.617, p = 0.057).

Figure 6: Student survey responses to the question 'If you don't understand something, do your teachers use a different language to help you understand?'



Total number of respondents: 383

Among student interviewees, however, there was a mixed response as to whether they had observed any changes to teaching during the project. Seven students responded that they are taught well by their teachers, yet these statements were rarely made in specific comparison to teaching before iMlango activities began and five of the fifteen students (in addition to one teacher) reported no observable changes to teaching over the last few years. This is to be expected among student respondents because of the significant length of time that iMlango has been operating in the schools. Adult interview groups were more able to identify specific changes. Notably, nine school staff observed that teaching had become more student-centred in the time since the iMlango project began (4 HTs, 5 teachers). It is important to stress the caveat, however, that on three occasions this was attributed to Kenya's new Competency Based Curriculum (CBC). Three teachers also specifically stated that their teaching processes had become more *'practical'*, as opposed to purely *'theoretical'*, since the onset of iMlango activities in the school, which was a clear indication of methodological change in these three instances. Three project staff also reported that teaching quality had improved due to their own lesson observations.

A second significant finding was related to the topic of teacher attendance. From the survey, 90% (305) students disagreed that their teachers are frequently absent from the classroom, suggesting that teachers maintain a relatively good attendance record. Similarly, a small

emerging theme from the KIIs was the fact that teachers were spending a larger proportion of their day teaching as a result of iMlango. The implicit reasons for this were twofold: whilst two respondents (1 teacher, 1 MoE) mentioned that teacher attendance had improved, four respondents (2 students, 2 teachers) specified that teachers were providing additional teaching to the timetable, whether in break/games time or before/after school, during remedial classes.

Teacher Case Study

Name: Dorcas
County: Makueni County

Madam Dorcas lives in Makueni County and has been teaching at her current school since 2017, having started teaching in 2009.

Dorcas noted that since iMlango started to work with the school, the "students are more interested in attending classes". She attributes this increase in interest to the introduction of ICT into the classroom. She says that she has noticed "less absenteeism from both students and teachers throughout the school term" and this has been further boosted by the feeding programme that has enabled students to stay at school and concentrate.

Dorcas has also noticed a great improvement in the literacy and numeracy performance of the students. Other activities, such as the girls' clubs, have also had a great impact as evidenced by the improved self-esteem and self-confidence of the girls.

Dorcas believes that teaching has been made much easier by the introduction of technology into learning. She states "a lot has been simplified with the use of computers and projectors". She finds teaching more enjoyable now given that they are using the same syllabus, but are aided by technology.

She believes that across the school teachers are putting in more time in planning and reviewing their lessons as compared to before iMlango's involvement. She feels that "teaching has become more practical as we can now teach through demonstration and illustration. The ICT enhancement has made this much easier".

She also acknowledged that the school administration has been very supportive of enhancing ICT classes. Even during COVID-19 a number of students were able to receive support virtually from teachers.

ICT and teaching quality

One finding of note was that the introduction of ICT was found to be an important factor in relation to teaching quality. Across four KIIs, technology was said to improve teaching by enabling teachers to provide visual demonstrations (two teachers, two HTs) and by helping teachers to teach all students at once (1 teacher). This appears to be reflected in student survey responses: 91% of the students (349 out of 382) agreed or strongly agreed that they were excited when teachers delivered lessons using computers, projectors or online resources. Only 5% (17) students disagreed with the statement.

Most significantly, ten respondents suggested that the introduction of technology made teaching easier, both in terms of preparing lesson content and lesson methodology (8 teachers, 1 HT, 1 MoE). One headteacher, for instance, said that the teachers' use of computers had positively impacted on students' performance because:

> *[...] if the teacher has spent less time preparing for notes and lessons, it means he or she has time to be with the learners and prepare teaching aids that can be more helpful to the learners. (Headteacher, KII)*

Indeed, when comparing teaching at iMlango schools to other schools in their area, 9 participants observed that teachers in iMlango schools now had the ability to use technology in their lessons and were exhibiting more confidence in doing so, in contrast to those at other schools (2 BoM, 4 MoE, 1 HT, 1 teacher, 1 PS). Significantly, one MoE official mentioned that teachers at iMlango schools were scoring higher marks on the Commission's TPAD programme (measuring ICT compliance). As a result, comparisons between teaching at schools with and without iMlango activities centred around the ability to use technology, summarised by one headteacher:

> *There is a big difference [in teaching]. Giving an example of the person teaching in an iMlango school, teaching a topic that needs more research or further clarification: as a teacher you can go to the iMlango application and access, for example, a maths teacher teaching a topic like fractions. If you are teaching in an iMlango school, you will access the application, go to the class, then the subject, then topic, select fractions and let the children listen to the explanation from the teacher in the gadget. iMlango also has past papers for the past years and the answers; if you are not in iMlango school, you cannot access that. (Headteacher, KII).*

Impact of continued professional development

Continued professional development was observed to be a key contributing factor to two of the changes to teaching outlined above: learner-centred teaching and the integration of ICT into teaching. These training sessions were conducted both face-to-face (whether centralised or at individual schools) and online (both before and during school closures).

Firstly, three project staff members reported that learner-centred training, which focused on giving students tasks appropriate for their ability, was provided to teachers to improve teaching quality. All three project staff members observed this being enacted at a classroom level and reported it led to learning improvements.

Secondly, the impact of training on ICT uptake was a major theme, as has already been mentioned in Section 4.2.2. Eight project staff explicitly identified that teachers developed ICT skills as a result of training. Seven project staff then reported that teachers were then able to incorporate these ICT and technology skills in the classroom, which enhanced teaching and lesson quality. This transformation from teachers being initially technophobic to being well versed in using technology in classrooms was therefore identified as a key factor underpinning improvements to teaching quality. Furthermore, five project staff members mentioned that teachers trained in using technology were able to pass this knowledge on to other teachers, improving teaching quality. Teachers who were more ICT literate would cascade knowledge to their peers to allow for continual improvements in teaching quality outside of training sessions. This was achieved by various means, including sharing knowledge on WhatsApp groups and Community of Practice platforms (1), mentoring one another via subject panels (1) and identifying teacher 'champions' to build the capacity of the wider staff (1).

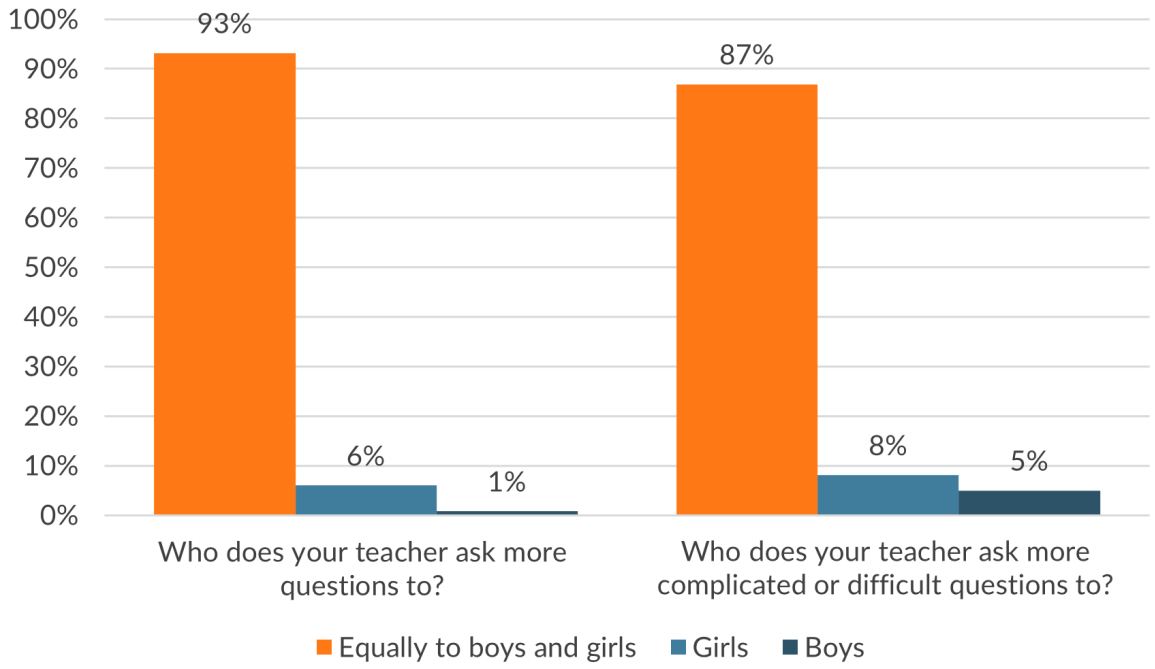
This was also a key theme in the school-level KIIs. The impact of training on the use of computers and other digital technologies in teaching was the factor most commented on by interviewees. Eight participants reported that the sessions were very beneficial in helping teaching further develop their teaching skills, both in teaching their subjects and in improving student progress in general (2 BoM, 1 HT, 1 MoE, 4 teachers) and they have encouraged teachers to pass on the skills learnt to fellow teachers and their students (1 BoM, 2 HT, 1 MoE, 7 project staff).

iMlango also provided online teacher training, which continued during school closures. An assessment of this aspect of training is included in chapter 4.2.2.

Gender-responsive and inclusive teaching

Teaching was found to have positively contributed towards increasing gender equality. In the survey, students reported that their teachers treat boys and girls equally (97%; 370). Teachers were also believed to ask questions equally to boys and girls by most students (93%), although some pupils think otherwise (6% think more questions were asked to girls and 1% to boys). When asking difficult questions, 87% think the teacher treats boys and girls equally, while 8% believe there's a preference for girls and the remaining 5% report a preference for boys (see *Figure 7* for more information). When disaggregating these findings, students from three counties (Kajiado, Kilifi, and Makueni) were more likely to agree that the teachers ask questions equally to boys and girls (Log odds =1.36, 1.2, 2.14; p = 0.02, 0.02, 0.005, respectively) than students from Uasin Gishu who reported that teachers asked more questions to girls (14 out of 99) than boys (1 out of 99).

Figure 7: Student survey responses to the questions 'Who does your teacher ask more questions to?' and 'Who does your teacher ask more complicated or difficult questions to?'



Total number of respondents: 383

Again, this was echoed in the KIIs. When asked about gender differences and equity in schools, thirteen interviewees commented that boys and girls are equal and are treated equally in school activities such as classes, lessons and guidance and counselling sessions (3 HT, 4 teachers, 6 students). One project staff member noted that it is the role of teachers to change attitudes and perceptions of gender roles, which has been a key aim of the project. This staff member then expressed they had observed improvements in gender responsive teaching as a result of training, for example through teachers arranging classes in ways in which all students can participate comfortably.

Project staff articulated a range of ways in which gender equity was achieved in the classroom. No clear theme emerged, but responses included:

- Creating separate lines of girls and boys when accessing the computer labs, so as to ensure an even gender split (2)
- Teachers embracing gender-responsive training methods, such as classroom seating arrangement and deliberately calling on more girls to answer questions (1)
- Challenging embedded gender stereotypes in social attitudes, the treatment of girls or gendered pedagogies (although this depends on the capacity of FOs to deliver this training) (1)

With respect to inclusive teaching practices for girls with disabilities (GwD), there were fewer clear responses. Across the survey, fourteen girls were identified as experiencing 'a lot of difficulty' across six types of disability (with two students reporting two types of disability each, hence the total figure of 16 reported in the table below).

Table 12: Percentage and number of girls from the student survey experiencing difficulty across six types of disability

Disability type	Level of difficulty	
	A lot of difficulty	Some difficulty
Seeing	1% (3)	7% (28)
Hearing	-	4% (16)
Walking	1% (4)	2% (8)
Remembering	1% (3)	10% (40)
Communicating	1% (5)	5% (20)
Selfcare	0.3% (1)	1% (4)

In the KIIs, five teachers stated that they did not have any GwD, whilst three teachers made a distinction between physical disabilities (motor) and other types of disabilities (hearing, cognitive) and hinted that students with cognitive disabilities were not classified as disabled, but rather as 'time takers' or 'slow learners'. However, there was some evidence of responsive teaching, with three teachers referencing specific teachers or activities which were undertaken to support girls (and boys) with disabilities. In general, teachers believed that GwD have been treated equally and in general have progressed due to the involvement of iMlango and other relevant initiatives, especially in communication and English (6 teachers). In addition, one teacher mentioned that the school also taught other students to be more respectful toward GwD to create a more inclusive learning environment. More detail about the specific impact of iMlango activities for GwD can be found in 4.2.2.

Additional teaching factors

There were no other major contributing factors that were said to contribute to changes in teaching. However, two participants did refer to cluster-level training, which enabled teachers to gain more skills particularly in the context of Kenya's new competency-based curriculum. Other factors that were reported to have impacted upon teaching quality included:

- Good relationships between management and teachers (1)
- Monitoring teachers via the government's TPAD approach (1)
- Employing PTA teachers to support regular teachers (1)
- Having more teachers than other schools (1)

4.2.4 Governance

The impact of project activities on school governance has been explored on two levels: school-level governance and county-level governance. Firstly, this section outlines the impact of iMlango learning and attendance monitoring data for school governance, before also exploring other perceived benefits of the project. Attention is also given to the buy-in of school governance staff and their level of communication with iMlango staff. The second half focuses

on county-level governance, presenting the engagement of regional MoE officials with iMlango and the project's influence within those systems. Finally, a brief overview of other contributions to school governance is provided.

Impact of monitoring data

Overall, the most significant change to school governance observed by interview participants was the increased use of digital learning reports and digital attendance reports in iMlango schools, which will each be explored in turn. Firstly, whilst three headteachers and two BoM members commented that the data from learning reports had been generally helpful in the running of their school, a further four headteachers and three teachers spoke of specifically acting on the data and using it to inform decision making. These actions included buying supplementary learning materials for low performing classes (1), reviewing or adjusting the timetable (2), rewarding and encouraging teachers where there is positive data and discussing improvements where there are gaps in the data (2) and making adjustments to teaching to support individual learners (1).

Secondly, the digital attendance reports were observed to be a factor of change for school governance. Comments from the KIIs appear to suggest that iMlango had improved attendance monitoring, due to the simplified nature of digitised reporting, however this was a relatively weak theme (2 BoM, 1 HT, 4 teachers). The use of attendance data by school management, however, was clear. In addition to four headteachers stating that they were able to learn about factors causing absenteeism from the data, three teachers and two BoM members commented that they were able to follow up with individual learners and their families. Three project staff members further identified that the project provided useful data on attendance in addition to portal performance and usage. Two project staff specifically articulated that attendance monitoring allowed headteachers to identify trends such as market days that impacted upon student attendance.

Correspondingly, six participants stated that they use the data to follow up with teachers regarding attendance and progress (4 HT, 1 MoE, 1 teacher). One headteacher also said that the data were motivating, especially when seeing improvements in learning and attendance in the data and receiving congratulations from iMlango staff. Only two participants (a teacher and BoM member) were unaware of reports being used to make any changes.

Additional benefits of ICT for school governance

Besides the impact of the digital reports, other observations provided less clear correlation between iMlango activities and changes to school governance. A small emerging theme was the benefit of the programme to managing school exams. Two teachers referenced the fact that they could submit results online due to the provision of broadband, and that this made such activities easier. Moreover, two management staff both referenced the comparative ease of conducting exams with iMlango technology (1 HT, 1 BoM). The headteacher specifically noted the cost advantage of not having to go to a cyber café to submit country-wide assessments, whilst the MoE official observed that iMlango schools are able to 'set, type and print' exams for themselves and that this made the process of assessment far easier than for other schools. Two MoE officials also noted that the schools' expenditure had been reduced by the ability to use

computers for downloading materials or printing resources, rather than going to cyber cafés to complete these tasks.

Another smaller theme was the impact of ICT and training on school management, although this produced a range of comments, rather than any common points. Respondents mentioned that school governance had been impacted by technology and ICT training through: being involved in iMlango seminars and training session (2); using ICT for administrative purposes (2); adjusting the timetable to accommodate ICT lessons for all classes (1); renovating the ICT room to protect the computers (1); being strict about attending ICT lessons (1); and sensitising administration on the importance of ICT (1). On the other hand, one MoE official suggested that the sensitisation of headteachers needed more specific focus:

> *I have made an observation that most headteachers are technophobic, they really fear things to do with computers. So, during training of the other teachers, if the headteachers can as well be incorporated in the training, it will really help because the crop of headteachers I have are the old ones; they fear technology, but I am sure through trainings with their teachers, they will also embrace the programme and they will like it. (MoE official, KII).*

It is, however, worth noting that project data suggests iMlango brought about a positive impact for school governance. The project set the target that the percentage of key stakeholders who view the intervention as making a positive impact on their ability to do their jobs better would increase by 15% from baseline to endline. This was exceeded: at baseline, 52% (44) of headteacher and deputy headteachers were found to hold this view; by baseline, this had increased to 87%. [NB. Jigsaw has been unable to corroborate the findings of this analysis, due to a lack of available data.]

School-level support and engagement

When project staff interviews turned to the matter of iMlango buy-in amongst school governance, four respondents identified that headteachers were supportive of the project. This support ranged from developing timetables to incorporate ICT into the school day (1), helping initially-resistant teachers to support the project (1), and supporting gender-responsive interventions (2). However, two project staff identified that this level of support was not replicated amongst BoMs. The main reasons cited for this lack of support were: the mentality among BoMs that the project was a donation (1), and being unsupportive of the project due to the high costs incurred such as through electricity bills (1). There was, however, a strong level of support observed among school management for encouraging education. In particular, eight respondents referred to a concerted effort on the part of school management to encourage students' parents about the importance of education (3 HTs, 2 teachers, 1 MoE, 1 student, 1 PS).

In terms of communication, school staff referenced good working relationships between school management and the iMlango team: a BoM member said that the partnership had been good and two teachers observed that iMlango support had been beneficial to school governance. However, two project staff indicated that communication with HTs and BoMs was limited at the beginning of the project, reducing support for the project. One staff member indicated there was an approach change in January 2019 to communicate project objectives

more clearly to headteachers and BoM members, which increased their engagement in iMlango. Another staff member indicated project staff had little interaction with BoM members until Covid (March 2020), after which the members began supporting the project more as they understood its ambitions.

It should be noted that there were a couple of negative responses amongst KIIs with school staff: two teachers stated that they had observed no changes to school governance due to iMlango, one student reported that they received no support from school leaders, and another teacher stated that their current headteacher did not appreciate and had little knowledge the iMlango project compared to his predecessor. This appears to support the assertion (outlined in the preceding section) that increased sensitisation of headteachers would have been a beneficial project activity, to encourage more consistent support for and engagement with iMlango (further discussion of this point is offered in Section 6.2.1).

County-level support and engagement

At the county-level, there appeared to be a high level of interaction between iMlango schools and county-level education officials. KIIs were conducted with six officials from six different sub-counties (across four counties), who between them hold the roles of Curriculum Support Officer (3), Curriculum Implementation (1) and Sub-County Director of Education (2). All six of the MoE officials interviewed stated that they had overseen or been involved in iMlango schools in some way. This included attending training or workshops provided by the iMlango programme (3), having close communication with the headteachers (2), supporting the school management (2), interacting with ICT teachers (1) and receiving briefings from the school (1). There was slight variation in terms of the county level at which this engagement took place: although one Sub-County Director said that the County Director was very supportive of iMlango, a Curriculum Support Officer in the same county said that the sub-county office was unaware of the programme. Interestingly, it was this same participant that reported no direct communication with the iMlango staff, unlike the five MoE officials who all stated that they had some form of regular communication.

Among the BoM members, there was also a high level of engagement with county-level officials. Five of the seven KII participants stated that they work with the county officials. Examples of this relationship between BoM members and MoE officials included the provision of training (2) and consultation when the school faced particular challenges (3). Significantly, even those BoM members who claimed not to have a working relationship with the county officials (2) said that the officials nonetheless were aware of the iMlango project.

Project staff, too, seemed in general agreement that the MoE was engaged with iMlango at a regional level, although stressed that challenges remain. Two project staff identified that the project was supported in all four counties, however two others recognised that this support was limited, due to a lack of awareness of how iMlango benefited or fit within the wider educational system. However, the engagement of CSOs in the project was regarded as particularly important. Three project staff expressed that they were especially supportive, for example through observing lessons (1) and using iMlango data to identify schools which needed support (1). However, one project staff member expressed that CSO support was limited by their engagement in other projects, which not only competed for the CSOs' time and

attention but allocated allowances to provide a financial incentive. As this was not offered by iMlango, CSO engagement therefore was dependent on developing personal relationships.

When asked about what they had learnt from the iMlango project, MoE officials offered a range of observations. These included:

- Training teachers on ICT use was an important part of the project (2)
- Students were stimulated by and learnt about ICT quickly (2)
- Creating *'21st century learners'* who are digitally literate is possible (2)
- The project had an reductive impact on absenteeism (2)
- There is a cost implication for the amount of electricity used (1)
- The data from the project encourages stakeholders to invest in computers in schools (1)

A small theme also emerged of MoE officials utilising the gains of iMlango. One commented that they had begun to use ICT teachers at iMlango schools as trainers on an online Teacher Performance and Development programme (TPAD), and that teachers from other schools were coming for demonstrations. Additionally, two MoE officials both commented that, when looking for ICT teachers, they would invariably select teachers from iMlango schools due to their higher scores in digital literacy.

Additional contributions to school governance

Beyond iMlango activities, there were a number of other factors which contributed to school governance. Most frequently mentioned was the acquisition of CDF (Constituency Development Fund) funding (two headteachers, two BoM members and one teacher), particularly for school renovations. Additionally, three participants referred to the introduction of the government TPAD for teacher monitoring (2 headteachers, 1 teacher). Aside from these more common comments, other contributions to governance were diverse, including:

- MoE officials providing training for the BoM (1)
- Large turnovers or changes to school governance structures (3)
- School timetable change to incorporate Catholic practices (1)
- Conducting teacher observations, sometimes with the support of the CSO (1)
- Introducing motivation and incentives for teachers (1)
- Implementing a School Improvement Plan, based on a government seminar (1)

Only one participant, it should be noted, specifically stated that no changes had been made to school governance aside from iMlango activities.

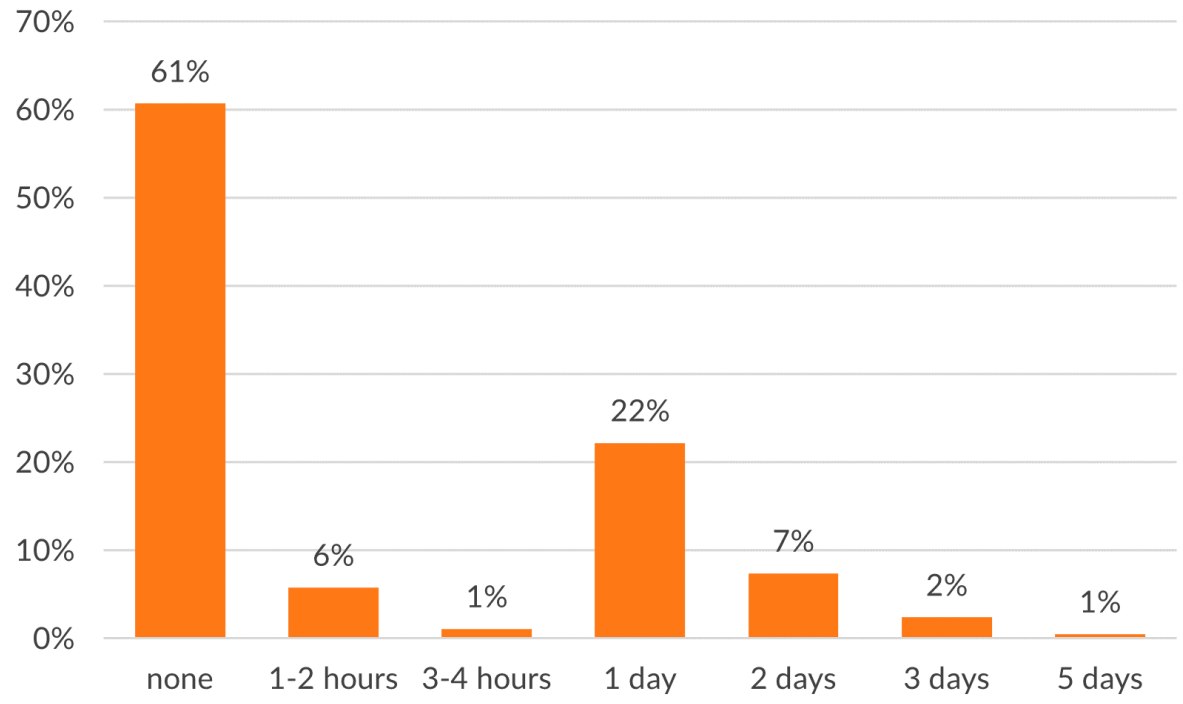
4.2.5 School enrolment and attendance

Overall, school enrolment and attendance was reported to have improved during the duration of the project. This section outlines these perceived changes, as well as presenting a number of contributing factors, including project activities.

Increased enrolment and attendance

Student survey responses provided a self-reported indication of school attendance (*Figure 8*). 61% of the students (232 out of 379 valid responses[5]) reported that they do not miss school in a typical week. 7% (26) miss less than a day of school, 22% (84) miss one day per week, 7% (28) miss two days per week, and the rest of the students (3%, 10) miss more than 2 days of school weekly.

Figure 8: Student survey responses to the questions 'How much time do you miss from school in a normal week, even when you want to go?'

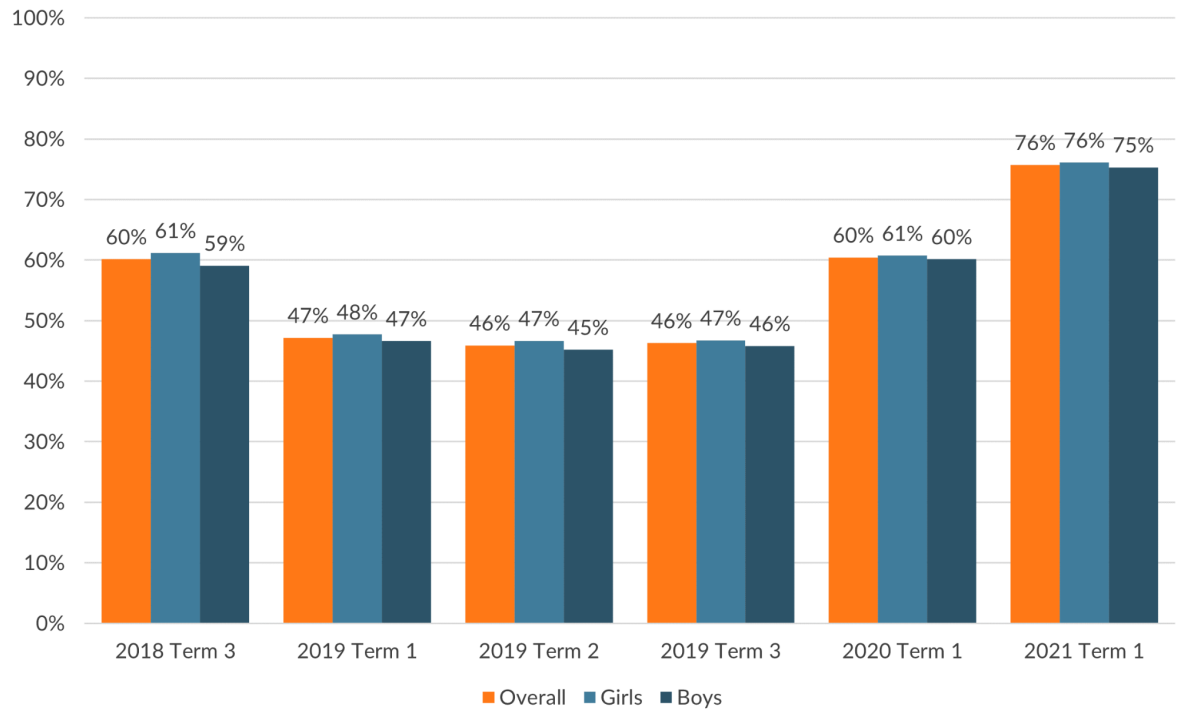


Total number of respondents: 379

Although a direct triangulation is not possible, project data from sQuid provides an indication of the average attendance of students since the beginning of the school year in 2021. The data (tracked via the use of smart cards at 155 schools across all four counties) indicates a slight improvement in attendance from January to March (from 75% to 77% overall) and little variation between girls and boys. The data also suggests a significant increase from the same period a year earlier: average attendance during Term 1 in 2020 varied between 50-69%, compared to 75-77% in 2021. Overall, attendance was shown to have improved from 2018. [NB. Jigsaw has been unable to verify these findings, due to a lack of available data and information about sampling.]

Figure 9: sQuid data on the average percentage of school attendance by term from 2018 to 2021

[5] In the following sections, all total responses are valid responses after the removal of missing values for respective questions in the student survey.



Total number of sample schools, across all four counties: 199 (2018 T3); 199 (2019 T1); 197 (2019 T2); 201 (2019 T3); 199 (2020 T1); 155 (2021)

When students were asked whether they think they will stay in and complete school, all fifteen of the KII respondents answered positively that they would. Elaborations on this answer provided further details. Four girls specifically stated that they wanted to finish school in order that they could help their parents in the future; three spoke of dreams and aspirations, often with regards to employment; two stated that education was important, hence their desire to keep learning. Further details about the impact of project activities on students transitioning from primary to secondary school can be found in Section 4.3.

Interviews with school staff reinforced this positive attitude to education amongst students, with participants reporting increased enrolment and attendance rates since the start of the iMlango programme. Five respondents reported increased enrolment (3 HTs, 2 PS), with one headteacher stating that the number of students had increased from 1600 to 2500 over their three years in the role. Furthermore, six of the eight headteachers reported increases in attendance, as did two teachers and one MoE official. Amongst these responses, one headteacher noted a particularly high increase in attendance from 80% to 95% (although this is unverifiable, as self-reported). It is obviously not possible to demonstrate fully a causal link between iMlango and the improvements in the schools, however there were some illustrations that presented the project as a clear and direct positive contributing factor. One headteacher explained this improvement in comparison with other local schools:

> *[...] there is no truancy and that chronic absenteeism of learners. In fact, the school is somehow different from the others because when we are giving reports in the zones, we get other schools saying that students have not reported, they are not attending, but here, our case is different unless now there is a transfer from one place to the other. (Headteacher, KII).*

Significantly, five of the eight headteahers who were interviewed emphasised that the rate of girls' attendance was higher than that of boys. One attributed this to iMlango (although the comment may also reflect gendered expectations of girls' appearance, as opposed to clear positive change):

> *These girls, there is a lot of impact on girl-child education, because iMlango is actually a partner in those programs. So the girls are so much encouraged and motivated and even when you come to the school, you will find that the girls are actually smarter and better than the boys when you look at them physically. They have proper uniforms and are looking neat until we are now confused because we see the boy child being left behind. (Headteacher, KII).*

Impact of project activities

Student surveys provided an indication of the factors which impact school attendance. Hindering factors are outlined in chapter 5.2, but it was interesting to note that 36% (139) students reported that they would not miss school due to any reason. However, there were a number of project-related activities which appeared to impact attendance positively. Although not significant, a trend emerged which showed students at Type A/C schools (with computer labs) to be more likely to remain in school. Moreover, both the use of the Maths-Whizz tutor, together with a frequent use of computers (as opposed to non-users), was shown to improve students' resilience when encountering attendance challenges (all p values < 0.005). In addition, students who use computers frequently were less likely to miss school for less than a day, when compared with those who do not use computers (p = 0.003). All of this indicates that iMlango technology was a contributing factor to improved attendance.

Table 13: Correlations between attendance and technology use

Factor	Correlating factor		
	Computer use	**Computer use (frequency)**	**Maths-Whizz Tutor use**
Attendance: never missing school for any reason	Negative trend	Positive (frequent use)	Positive
	LO = -0.398; p = 0.12 (n.s)	LO = 1.019; p = 0.003	LO =1.084; p < 0.001
Attendance: time spent absent from school	Positive	Negative (frequent ~ 1 day or less)	Negative (both levels)
	LO = 0.793; p = 0.014	LO = -0.982; p = 0.003	LO = -0.67 and -1.263; p < 0.001

Negative and positive correlations are specified in the table. n.s. stands for not significant (p > 0.005). When only some levels of correlations were significant, they are also specified after the direction of correlation.

Comments from the KIIs supported these findings, as the introduction of ICT into iMlango schools was spoken of as a motivating factor: fourteen interviewees stated that students were more excited and keen to come to school in order to access the technology (5 HTs, 3 MoE, 3

students, 3 teachers). Indeed, one MoE official stated that the school had experienced an *"influx of learners" (MoE official, KII)* when local students heard about the computers, and a student stated that she had specifically enrolled at the school due to the iMlango project.

A second factor was the introduction of attendance monitoring, which eleven participants considered to have increased school attendance (4 HTs, 2 BoM, 2 MoE, 2 teachers, 1 student). Interestingly, the use of monitoring - in particular through attendance cards - was spoken about both as a motivating factor (which students enjoyed) and as a deterrent factor (increasing attendance through fear of being disclosed). Three project staff members provided further insight, reporting that the cardless monitoring system was more effective than using the card based system. However, one project staff member identified that having to do both hard copy reporting (in line with MoE reporting structures) and digital reporting doubled the workload of the teachers.

A third theme to arise from the KIIs was the impact of microloans. Four participants mentioned this initiative (1 HT, 1 MoE, 2 PS), stating that it had encouraged and enabled families to send their children to school through supporting household income, thus improving attendance. One project staff member also reported that the microloan helped generate awareness of the project within communities. On the other hand, there were some negative comments about microloans. One staff member articulated that the microfinance aspect of iMlango was unsuccessful due uncertainty about its position within the project, and its minimal impact, arguing that there are enough microfinance projects already in Kenya. Furthermore, although it was reported that most parents who took out a loan had not paid back since 2019 (1 BoM), one teacher stated that there could have been more tolerance, considering the financial impact of Covid-19, since some parents had been *"harassed"* by the repayment team repetitively during that period. These findings seem to suggest (along with other household support schemes, outlined in the section below) that financial assistance was a contributing factor to improved attendance rates in some cases, but the design and management of this scheme needed more careful attention and in some cases its application received negative feedback.

Other project activities which were said to impact on attendance rates included:

- Engaging with parents to encourage attendance (2 teachers)
- iMlango seminars increasing cooperation between the school and the parents (1 HT)
- Schools' improved academic performance increasing enrolment (2 HTs)
- Motivation from teachers and iMlango staff encouraging students to attend lessons (1 student, 1 HT)
- Girls' clubs motivating attendance (1 HT)

Additional contributing factors

Along with iMlango's microfinance scheme, other household support initiatives - not related to iMlango - were considered to be contributing factors to school attendance. Six participants referenced school feeding programmes or shopping vouchers as having a positive effect on attendance (3 HTs, 1 BoM, 2 MoE, 1 teacher). Like microfinance, these were said to reduce the financial burden of not having children at home and to act as incentives for children to come to school.

Although no other factor was referenced on more than four occasions, three other themes emerged related to impacts on enrolment and attendance. Firstly, four participants referred broadly to a conducive school environment being important for enrolment and attendance, particularly in terms of the positive impact of kind, friendly teachers (2 HTs, 2 students. Secondly, the provision of sanitary pads was said to be an important resource for girls, improving their attendance (1 student, 1 BoM). Thirdly, receiving encouragement from specific stakeholders was also an emergent theme. BoM members, local stakeholders (such as MPs and the Catholic Church), parents, friends and a motivational speaker were mentioned across five interviews as a source of motivation and support for staying in school. Two students also stated that they felt motivated to continue learning when they considered examples of peers who had not stayed in education.

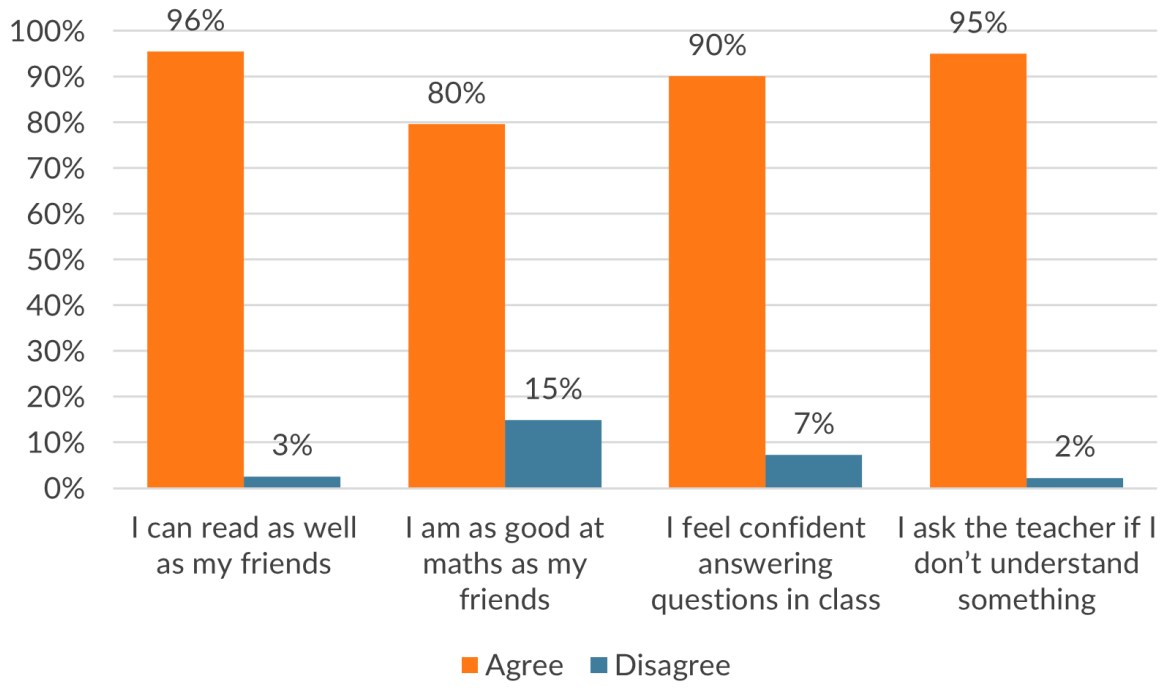
4.2.6 Life skills

Beyond the impact of project activities on learning, teaching and governance, the project has provided additional benefits to students. This section outlines the three main themes related to additional benefits: increasing student confidence and self-esteem; providing life skills to girls via the introduction of girls' clubs; and the provision of other activities and resources in order to support girls at school.

Confidence and self-esteem

The student survey included questions probing additional benefits the project has created for learners. In particular, it explored students' confidence in class (*Figure 10*). 96% of the 383 students reported to think that they can read as well as their peers; comparatively, only 80% of students claimed to believe that their maths is as good as their friends' and 15% disagreed with the statement. 90% of these students felt confident enough to answer questions in class and 95% to ask for clarification, while 7% and 2% of the students claimed not to have the confidence for either respective action. These benefits did not seem to vary significantly across school type or grade. In comparison with Uasin Gishu students, those from Makueni were significantly found to lack confidence in answering questions (log odds = -1.39, p = 0.009); no other significant differences were found.

Figure 10: Student survey responses to questions related to confidence in class



Total number of respondents: 382; 382; 383; 383

Confidence was also an emergent theme in the KIIs. The iMlango project as a whole was reported to increase self-esteem: four interviewees stated that pupils had increased in confidence and the ability to express themselves, especially due to their increased interaction with ICT (1 HT, 1 MoE, 2 teachers). Indeed, girls were especially said to have benefited from increased digital literacy: one student stated that she now felt "calmer" using computers than before, whilst a teacher stated that, to begin with, some girls would hide during computer lessons but have now started to enjoy them. Two project staff also positively reflected on designating girls as computer champions. Both staff reported that this aspect also boosted the confidence and self-esteem of girls.

Comparisons with non-iMlango schools were particularly illuminating. Participants noted the difference in behaviour and support at iMlango schools. One student commented that pupils are treated better at iMlango schools, particularly due to guidance and counselling; a headteacher also reported that students at their school displayed higher self-esteem due to the use of ICT, whilst a BoM member suggested that discipline was higher at iMlango schools.

Girls' clubs

The introduction of girls' clubs (run by Impact(ED), formally the Discovery Learning Alliance (DLA))) were another key additional benefit. From the survey, 17% (66 of 383) of students reported to be members of a girls' club while 80% (305) stated not to be. When asked about the benefits of being part of a girls' club, students overwhelmingly agreed that it helps to increase confidence, to learn to solve problems and to make decisions in their life (99%, 99% and 100% respectively).

The impact of girls' clubs was also discussed frequently in the KIIs. Six participants referred to this specific activity, particularly noting the life skills gained from the clubs (2 teachers, 2 BoM and 2 HTs). Girls were said to gain confidence and self-esteem, as well as benefit from hygiene and sanitation activities. One teacher, for instance, stated:

> *So we had a girls club and we could open an episode we discuss, they give out their views as per what they have learned from every episode. It was so encouraging to the girls. And it gave them high esteem, encouragement… even they were performing even in now classes. It made the girls aware of themselves and could express themselves freely. Even today they express themselves freely about what they are doing at home and what they are encountering in life, they are free to explain. (Teacher, KII).*

Six project staff further identified girls' clubs as a valuable component of iMlango. In particular, three project staff outlined that the clubs' boosted the girls' self-esteem. This increase in self-esteem was reported to have led to young mothers returning to school (1 PS), in addition to increasing the number of girls staying in school (1 PS). Three project staff also expressed that girls felt comfortable being open and sharing the barriers and challenges they had faced in the clubs. Another benefit of the girls' clubs (according to 1 PS) was that it taught about womens' rights on issues such as child marriage. The project staff member argued that girls' awareness on these issues is powerful, and that, in the case of two rural schools in Kajiado county, girls clubs had helped to improve self-awareness which eventually led to a reduced number of pregnancy cases (the lack of firm data to corroborate this reduction, however, should serve as a caveat to this statement).

Additional support for girls

A range of resources (e.g. clothing, menstrual care products, shopping tokens) and guidance activities (on life skills, menstrual health, relationships) were also reported to have helped girls attend school, build confidence and earn life skills (1 BoM, 1 HT, 1 teacher, 1 student). These were sometimes through girls clubs but largely separate from iMlango activities. Two interviewees referenced the fact that girls are provided with more latrines than boys (1 BoM, 1 student). Furthermore, two respondents referenced the provision of sanitary pads as an important support to girls (1 HT, 1 student). These sanitary pads were said to have been provided by a number of sources: the government (2), alumni students (1) and CCF (Child Fund) (1). Additionally, one BoM member highlighted the fact that girls at non-iMlango schools do not benefit from these girls' championing activities (particularly hygiene and sanitation related initiatives) and therefore miss school during their menstruation.

Finally, two project staff outlined that the iMlango project changed perceptions of gender roles among parents and communities, due to the value placed on girls' education. Overall, one project staff member summarised the importance of gender interventions within iMlango by summarising: *'Life skills and career goals for girls have changed as a result of the project.' (iMlango staff, KII).*

4.2.7 Commentary on project design and delivery of outcomes

Overall, the project design appears to have made a positive contribution to a range of learning outcomes, including improved literacy and numeracy performance, more equal participation of girls and boys in the classroom and student confidence. The impact of project activities on teaching and governance was less clearly observable, although school staff appear to have benefitted from the provision of ICT and iMlango support. Activities related to increased digital literacy which were reported to have led to marked benefits include the provision of ICT, digital learning content, attendance monitoring data and the girls' clubs. More discussion of valuable activities can be found in chapter 6.2.1.

It is clear that many aspects of the project design and implementation have been well thought through to achieve a positive impact on learning. There were, however, many challenges faced and these are discussed in full in chapter 5.2 and chapter 6. There are two other overarching considerations related to the topic of project design: safeguarding and the contribution of external stakeholders - each of which are now explored in turn.

Safeguarding

Safeguarding was identified as an aspect of the project design which could benefit from improvements. Among school-level interviews, there was only one mention of safeguarding: a teacher who referenced being trained on topics including child protection. Other than this, however, there was a clear lack of discussion surrounding safeguarding.

Safeguarding was also rarely discussed among project staff. Where it was discussed, two project staff identified that safeguarding processes could have been improved, particularly in the initial stages of the project. One project staff member outlined that safeguarding messages for gendered aspects of the project were sent out, but were not always received. Another articulated that safeguarding was introduced late in the project, and project staff initially handled safeguarding issues according to their own individual processes, before a policy aligned with GEC standards was developed. Finally, one project staff member outlined that having only a single safeguarding officer for the project created a number of issues. Firstly, safeguarding data from 245 schools would be sent to a single officer, which would be overwhelming. Secondly, the project was said to have only enough allocated money for a single field officer, who in turn had to individually establish safeguarding procedures. This was identified as a significant challenge. Therefore, to improve the safeguarding process in the future, one project staff member articulated that it would be advisable to allocate more funding to it.

External stakeholders

Considering the impact of other factors (beyond the direct remit of iMlango) is a core component of the contribution analysis approach adopted by this evaluation. This section therefore outlines the involvement of other actors which coincided with iMlango activities.

There were two sources of support which were mentioned multiple times across the KIIs. Firstly, the Kenyan government. The national Constituency Development Fund was said to have provided the funds for four schools in two different districts to conduct school renovations (2 HTs, 2 BoMs, 1 teacher). Moreover, the government was said to have provided a range of materials for schools, including sanitary pads for girls, lockers, free books, tablets and laptops (4 students, 1 HT, 1 teacher). Local MPs were also mentioned as specific sources of support, providing food for pupils during their KCPE exams (1 HT) and funding for school buildings (1 student). As a caveat, it should be noted that one headteacher stated that financial support from the government was not adequate, especially for providing sanitary pads for girls.

Secondly, the Catholic Church was found to be a key contributing stakeholder to two iMlango schools (1 BoM, 2 HTs). This sponsorship was said to have impacted the schools in a number of ways: the provision of guidance and counselling (2); the introduction of ICT (1); increased support for tackling absenteeism (1); and the introduction of Mass and prayers at school (1). In these two schools, therefore, some iMlango activities were seemingly supplemented by activities of the Catholic Church.

Across the interviews, other school partners which were mentioned included:

- CCF (Child fund), an organisation sponsoring girls by providing towels/food and building classrooms (1)
- Solid Rock, and organisation which supports learning via the computer lab (1)
- The USAID sponsored Tusome programme, which targets grades 1 to 3 in literacy via the computer lab (1)
- An (unnamed) NGO, set-up by alumni, which provided free school renovations (1)
- Another (unnamed) sponsor who provided lockers (1)

All learning outcomes observed in iMlango schools should therefore take into consideration the contribution of these external stakeholders.

4.3 Impact of project activities on transition

This section presents student surveys, KIIs with educators, students, and project staff, and sQuid's attendance data regarding girls' transition through education and related topics such as their aspirations in progressing post primary school. Commentary is also included to address the appropriateness of the project design in improving transition outcomes, largely drawing from qualitative data from the contribution analysis.

While the transition outcome presented here was not based on cohort tracking (as had been the original intention), the evaluation collected different types of data related to transition within and beyond primary school. Relevant findings related to the impact of original project activities on transition are included.

4.3.1 Aspirations to transition to secondary school

The vast majority of the students shared an aspiration in finishing primary school and/or transitioning to secondary school. 99.5% of the students surveyed (281 of 283) agreed that they would like to continue their education after the current year (2019 - 2020). Within the 30 Grade 8 students who would be transitioning to secondary school in the next year, all of them expressed an aspiration to transition to secondary education. Furthemore, 98% (377) of the students agreed that they would complete their studies in primary school while only 0.5% (2) disagreed. The remaining four students answered 'do not know'. No significant correlation was found between students' self-reported completion rate and all three disaggregating factors, suggesting that the aspiration to finish school was indeed shared by all students regardless of their school, grades, or location. Since these questions asked for self-reported data on (aspiration of) transition and no other data on transition was collected (for example Difference in Difference improvement used in the logistic framework), it is not possible to compare the survey data with the initial targets set by the logframe.

These findings are echoed in the KIIs. When students were asked if they felt supported to finish primary school and go to secondary school, the overwhelming response was affirmative. Thirteen out of the fifteen students interviewed said explicitly that they felt supported, with the other two implying that they would be able to transition schools.

Disaggregated survey data suggested some regional differences regarding whether students would remain in school regardless of external reasons. Just over 70% (69) of students from Uasin Gishu reported that nothing would stop them from finishing primary school in comparison with 29% for Kilifi, 44% for Makueni, and 57% for Kajiado. The differences are significant (X^2 (3, 382) = 37.014, p < 0.001). Additionally, in comparison with Grade 8 students, those from other Grades were more likely to be unaffected by external reasons to drop out (X^2 (4, 381) = 20.945, p < 0.001). All significant effects are confirmed in logistic regression models. No significant school type effect was found regarding the lack of external reasons for dropping off, meaning that being in a school with ICT labs did not necessarily increase students' ability to remain in school when faced with external difficulties.

Driving factors for transition

Several reasons were found to affect whether students were likely to report that they would finish school from the interviews and surveys. During the KIIs, twelve out of the 15 students stated that their teachers had provided enough support for them to be able to transition: this support included encouraging students to work hard, providing advice to students, supporting students' discipline and behaviour, answering and asking questions, supporting students with their school fees (both contributing financially and allowing students to attend lessons before fees were paid), and providing extra teaching in break times.

Beyond support from teachers, family was reported to have the biggest impact on aspirations to transition to secondary school. In the survey data, students reported that both having supportive parents and family that treated boys and girls equally encouraged them to complete their studies (Log odds - 5.911, p < 0.001 and Log odds = 2.925, p = 0.041).

The majority of interviewed students also referred to receiving support from their parents (and occasionally other family members) for transitioning to secondary school (12 responses). The kind of support varied slightly amongst these responses. A large number of them mentioned financial support specifically: six students said that their parents paid their school fees; four mentioned their parents purchasing uniforms or other school materials for them. Non-financial support was more mixed: three students stated that they receive encouragement from their family to transition to secondary school; one mentioned that her parents were strict about her staying in school; finally, two students referred specifically to receiving teaching from their parents whilst at home.

Other than parental support, there were few other contributing factors to student perceptions of transitioning to secondary school. Perhaps surprisingly, having a disability also had a positive correlation with the self-reported aspiration to continue studying regardless of external obstacles, potentially suggesting that students with disabilities were more resilient and more eager to stay in school (LO = 1.34834, p =0.041). In KIIs, one student mentioned receiving support from a family friend; another said that she looked up to role models at schools. One stated that she would like a scholarship for secondary school; and a final girl referenced watching a TV programme which encouraged students to continue their education.

School management attitudes to transition

Beyond the data from students, the mentioning of transition was limited and only three particular comments from other KIIs were relevant. Firstly, a BoM member stated that, due to an improvement in student performance, the school was able to transition a number of high-performing pupils into secondary school. Secondly, a MoE official noted that, due to iMlango's financial support, parents had been able to save money to afford to send their children to secondary school. Finally, one headteacher spoke about exploring alternative transition routes for students. He explained that low-performing students were being encouraged to consider attending a polytechnic or vocational training, instead of secondary school. The rationale for this was that even with a 100% transition rate, those with low marks would struggle to manage secondary school, so a polytechnic would be more suitable to their level. He therefore reported organising trips to visit these institutions, to widen the students' awareness of their future choices.

4.3.2 Retention and completion

No monitoring data was gathered through the lifetime of the project that enables an assessment of retention or completion of students. Jigsaw is therefore unable to comment on this subject, as the iMlango consortium members have been unable to provide Jigsaw with any data related to this area.

4.3.3 Commentary on project design and delivery of outcomes

Although the findings of this evaluation indicate a high level of aspiration to transition to secondary school, there is no clear indication that this was caused by something specific within

the iMlango project design. The two main factors (receiving support from teachers and family) do not refer directly to iMlango activities. The reports of increased transition from a BoM member and project staff member indicate that improved learning performance may be having a positive impact on the numbers of students moving on to secondary school. However, no firm data was available to confirm this possibility. It is therefore difficult to comment on the impact of the project design, as no clear link with student transition was observable in the evaluation data.

4.4 Impact of response to Covid-19 school closures

This section will focus on the impact of iMlango activities implemented during the Covid-19 school closures. On 15th March 2020, the Kenyan government closed all schools in order to mitigate against the spread of the pandemic. Schools remained closed, and formal examinations cancelled, until a phased reopening. In-school teaching returned on 12th October 2020 for grade 4, class 8, and form 4 students, in order that they could prepare for the KNEC assessments in March 2021. Other students returned on 4th January 2021, to continue the academic year.

In response to the educational disruption caused by Covid-19 and the associated school closures, iMlango established three key initiatives: an application (app) for smartphones, through which to access iMlango learning content; teacher training and support; and the creation of WhatsApp groups, through which to communicate distance learning activites and distribute learning materials, alongside the provision of printable materials. Each of these is outlined below, and the end of the chapter discusses the relevance and impact of iMlango's response to school closures.

4.4.1 iMlango app

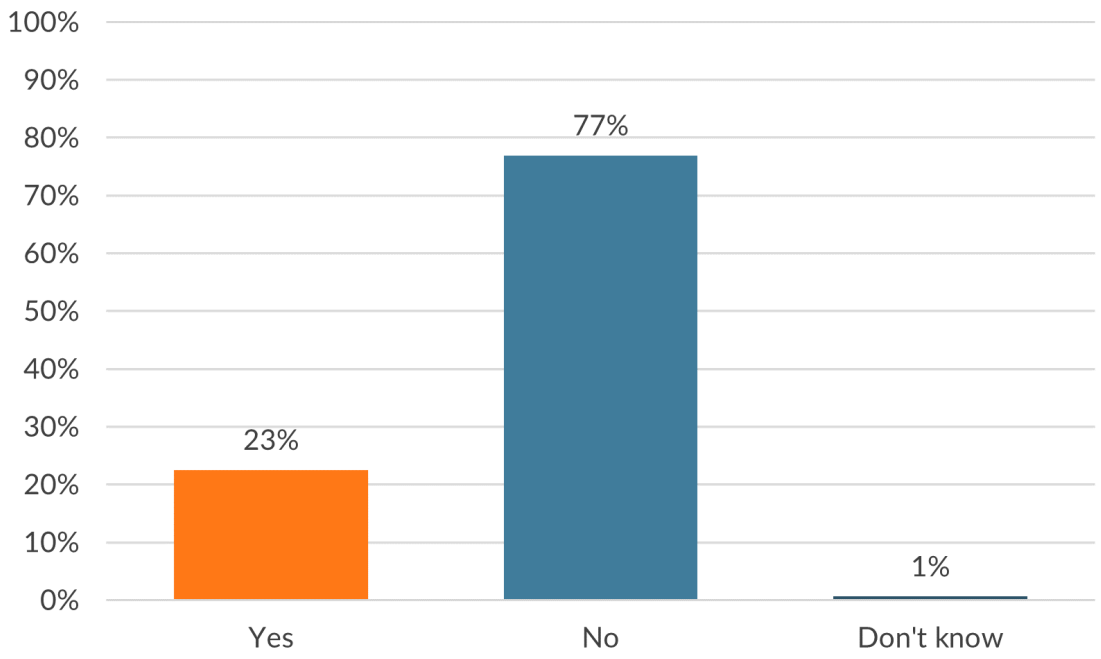
This section outlines the impact of the iMlango app (a platform which provided access to digital teaching and learning content, including literacy stories and Maths-Whizz numeracy content) during the Covid-19 school closures. It covers the uptake of the app, barriers which hindered access to the app and the app's ease of use.

Uptake of the app

As one of the main learning resources developed to encourage learning during school closures, the iMlango app was accessed by some students according to the student survey results. Only 23% of students (75 of 333, after excluding missing values and invalid data) used the iMlango app during school closure, while 77% (256) of them did not (*Figure 11*). This is notably higher than project data, which indicated that 3% of students (3121 of 105663) accessed the app. The figure of 3% was based on the number of unique log-ins to the app after the onset of school closures, and was therefore in reality likely to be slightly higher, due to the strong possibility that multiple students used the app via a single app/device. However, it remains a significantly lower figure than that of the student survey, potentially due to the difference in data collection

methods (self-reported survey vs digital data collection). [NB. Jigsaw has been unable to verify the project-level findings, due to a lack of available data and information about sampling.]

Figure 11: Student survey responses to the question 'Did you use the iMlango learning app during school closures?'



Total number of respondents: 333

Amongst the KIIs too, uptake of the iMlango app during the Covid-19 school closures was found to be low. Of the fifteen students interviewed, ten reported not to have known about the app, two did know about it but did not use it, and three did use it. Similarly, 10 out of 14 project staff interviewees identified that the uptake of the app was extremely low, falling far short of its intended target of 40%. This led four project staff to claim the app intervention was unsuccessful. As one staff member summarised: "*The approach we took I would not speak very highly of." (iMlango staff, KII).*

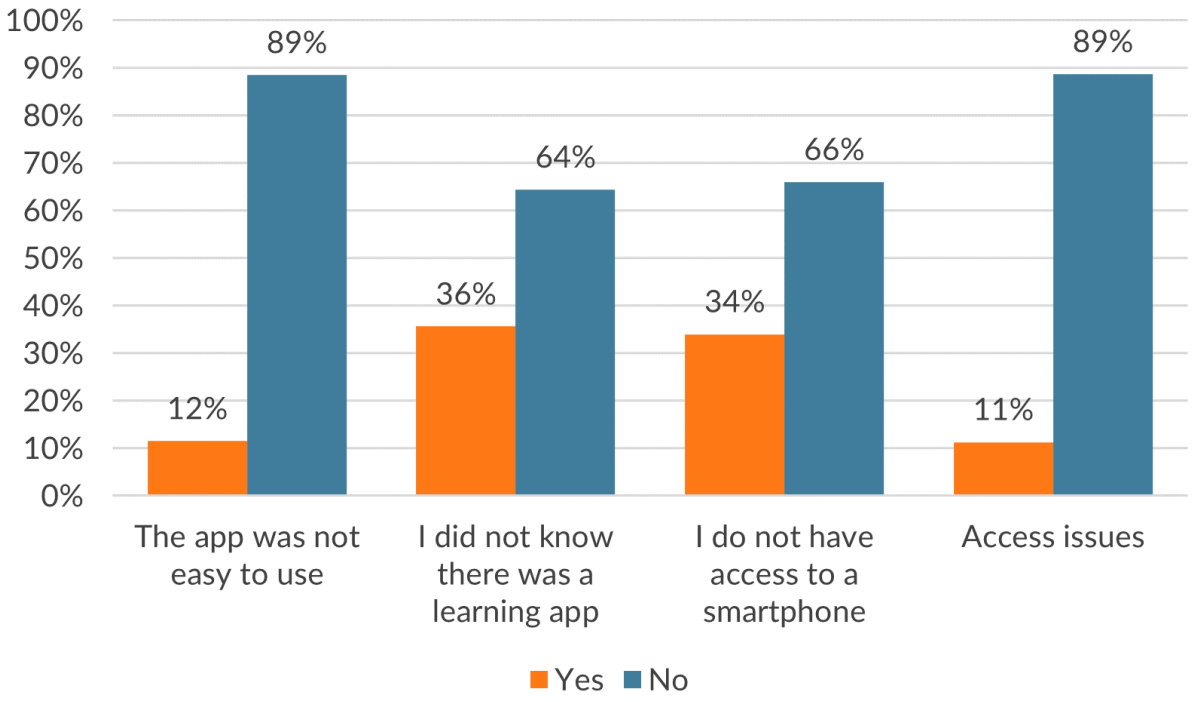
Regarding differences across different counties, students from Kilifi used the app the least (6%, 6 out of 97) in contrast with other counties (23%+) (X^2 (3, 97) = 24.329, df = 3, p < 0.001). In particular, students from Kilifi were significantly less likely to use the app when compared with Uasin Gishu (LO = -2.116, p < 0.001). On the other hand, students from Kilifi were nonetheless less likely to be unaware of the app in comparison to those from Uasin Gishu (LO = -0.981, p = 0.01). App use frequencies were not statistically tested due to low frequencies.

Among school demographics, students from Type A/C schools were significantly less likely to be unaware of the app than those from B schools (LO = -1.122, p < 0.001). Additionally, all school grades were more likely to be unaware of the app than Standard 8 students (LO ranges from 1.78 to 2.2, p < 0.02).

Barriers to app access

In the survey, two main reasons were provided by students for not using the app: not being aware of the app (36%, 90) and having no access to a smartphone (34%, 66). Other responses included: the app being not easy to use (12%, 29) and access issues (no or wrong credentials) (11%, 22) (*Figure 12*). In comparison to those from Uasin Gishu, students from all other counties are also less likely to have no access to a smartphone, although only the difference between Makueni and Uasin Gishu was significant (LO = -1.887, p = 0.002).

Figure 12: Student survey responses to the question 'Why did you not use the learning app?'



Total number of respondents: 253; 253; 253; 195 (due to missing values)

Further details add depth to these findings. Among the ten students who did not know about the app, one claimed that she only learnt about the app once she returned to school, whilst two others said that they knew of other children who had used their phones for learning from other schools but did not themselves. There were also a number of barriers referenced by students which prevented them from using the app. These included:

- Parents not having a smartphone (2)
- The cost or lack of access to the internet (2)
- Parents not providing assistance (1)
- Not knowing how to access the app (1)

This was echoed by interviews with school staff, management and project staff. Fifteen respondents stated that the success of the app was limited by a lack of access to smartphones amongst local families, due to their expense, the cost of buying data bundles or the rural, marginalised areas in which iMlango schools are situated (4 teachers, 3 HTs, 1 BoM, 7 PS).

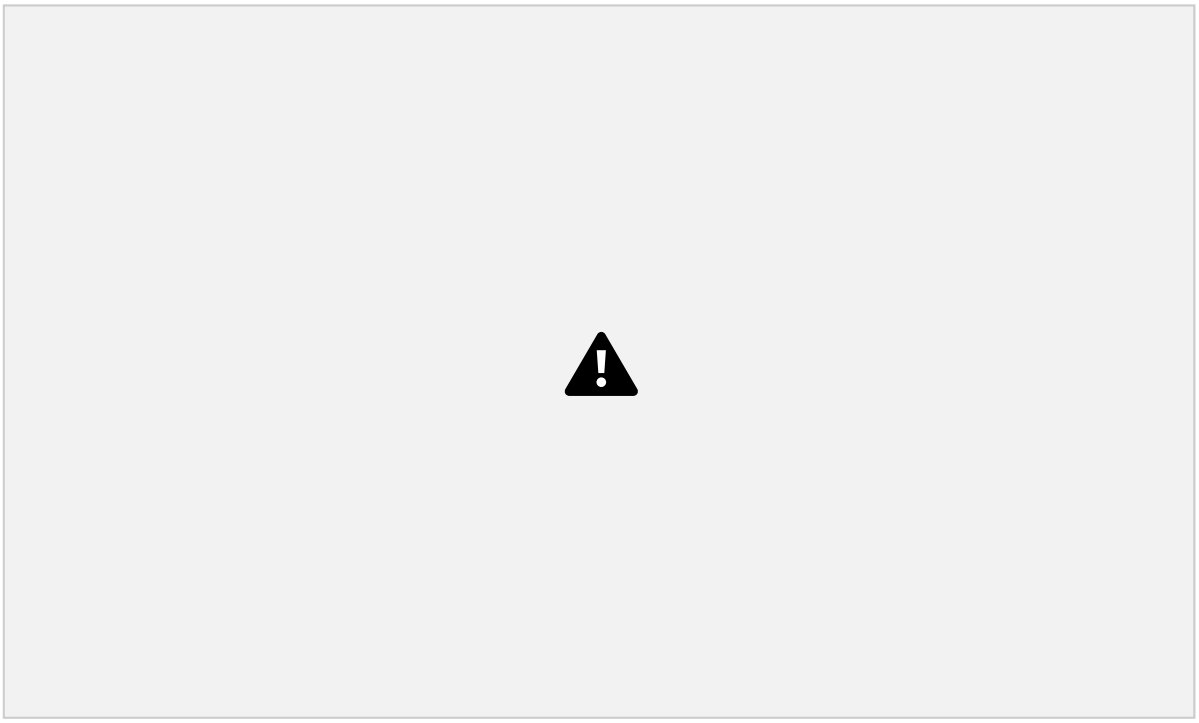
Indeed, one project staff member estimated that 60% of parents do not own smartphones. Moreover, while project data on app access mainly focused on the general low uptake of/access to the app, one staff member noted that Covid-19 restrictions meant that awareness for the app had to be generated over the phone (rather than with field visits), and generating awareness over the phone was difficult.

Overall, three project staff identified that the response was poor, with one articulating that: "*What iMlango has done has been lost, due to Covid." (iMlango staff, KII).*

Ease of use

For the limited number that did use the app, 43% (32) claimed to have used it often, and a further 49% (37) purported to have used it sometimes; of the other students, (8%, or 6) barely used it (*Figure 13*). 80% of these students could access the app as often as they wanted, yet 15% disagreed with the ease of access. Regarding the ease of use for the app, 76% of these students thought the app was easy to use; in contrast, 12% claimed the opposite. More coherently, all but one student (who answered 'neither agree nor disagree') agreed that the app was helpful for learning (*Figure 14*).

Figure 13: Survey responses to the question 'How often did you use the learning app during school closures?', by students who used the app

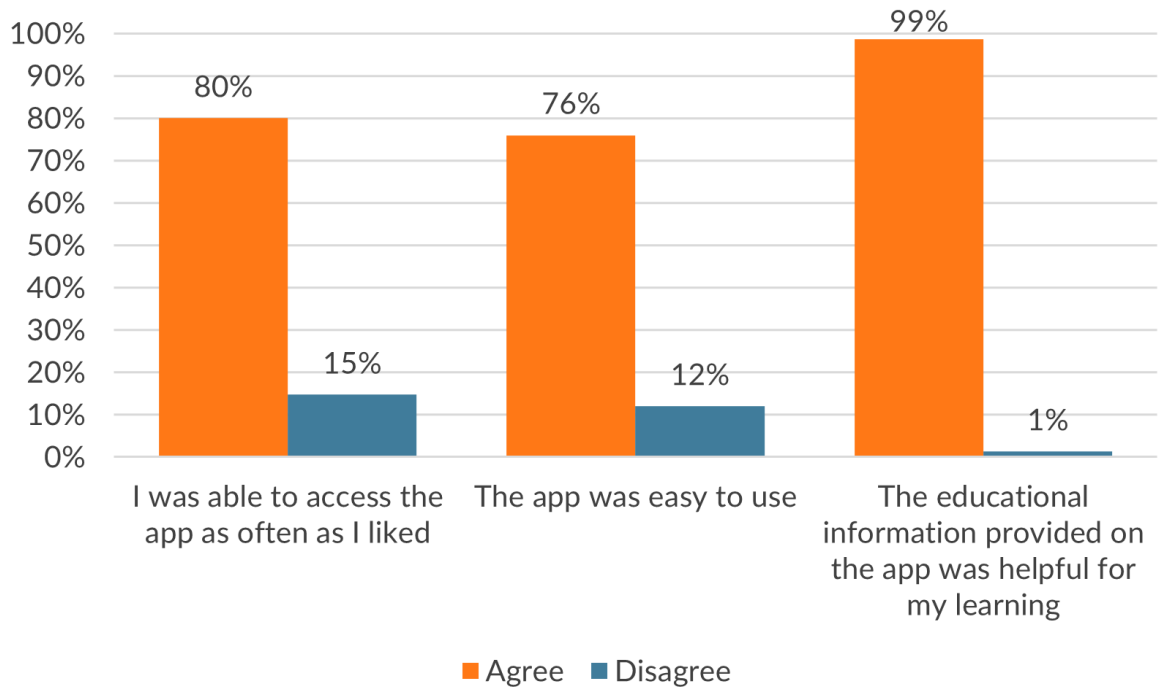


Total number of respondents: 75

Significantly, age was also a key predictor for the app's ease of use, with older students reporting the app to be easier to use that their younger peers (LO = 0.682, p = 0.019) (note that age is not always accurate in the current data as sometimes birthdays were estimated by the survey enumerators). Of the three student interviewees who did use the app, two expressed positive opinions of their experience. Both stated that it was easy to use and enjoyable, and

both were able to access it by using a parent's smartphone. The other student, conversely, stated that she stopped using it due to its expense. Similarly, two project staff members acknowledged that although the app was limited in its uptake, there were some reports of it working well for those who did access it.

Figure 14: Student survey responses to other questions related to ease of use of the iMlango app, by students who used the app



Total number of respondents: 75

4.4.2 Teacher engagement, continued professional development and support

This section outlines the extent to which teachers were engaged in learning activities during the Covid-19 school closures and, in turn, received continued professional development and support from iMlango.

Teacher engagement

The surveys included questions on how students viewed their learning environment and progress during school closures. A large majority - 80% (203) of the students - felt that their teachers supported them during school closures, while 19% (74) disagreed. It is noteworthy that students from Type A/C schools were more likely to report that their teachers were supportive during this time (LO = 0.847, p= 0.002) than those from B schools. Additionally, students from Kajiado (LO = -1.049, p = 0.005) or Kilifi (LO = -0.741, p = 0.002) were less likely to report supportive teachers than those from Uasin Gishu.

Likewise, whilst eight students reported receiving some form of support from teachers (including being sent books and materials (2), receiving recordings of teaching (1) and being given support in reading (1)), another two students reported receiving no support. There was, however, one emerging theme of note. Three students and one headteacher commented that teachers provided support to students who lived locally to them. One student, for instance, stated that "*If there is a teacher living near us, I will ask him to assist me with some past papers and I will do them and ask him or her to mark for me*" *(Student, KII)*. This suggests that teacher engagement during the Covid-19 school closures was to some extent dependent on teacher locality, with some students receiving in-person support as opposed to online learning.

Two project staff members also outlined limitations in dissemination of work materials. One project staff member reported that teachers would only share a small sample of worksheets back to the project, who were subsequently unsure of the full extent of worksheet engagement. Another project staff member argued that worksheets were only distributed to 1-3 teachers per school, who could then only distribute materials to 1-3 students each which was a significant barrier to worksheet uptake. This was echoed in KIIs with headteachers, which provided conflicting reports regarding TLM dissemination: one headteacher stating that some had been provided whilst another stated that none had.

Continued professional development and support

Discussion of continued professional development amongst interview participants provided mixed feedback, with the sample of school staff (teachers and headteachers) in general giving less positive feedback than project staff. Four school-level participants reported that training took place (3 HTs, 1 teacher). However, six interviewees (3 HTs, 3 teachers) stated that no training was provided during school closures, whilst a further two teachers claimed that they tried to access an online course but were unable to do so. Moreover, three teachers mentioned that, although they were in communication with the school and iMlango field officers in some form, the support they received and the involvement they had during school closures was insufficient.

Project staff interviews, on the other hand, suggest that these responses are not wholly representative of all iMlango teachers. Project staff outlined two successful approaches to continued professional development during school closures. Two respondents identified the Camara Learning Academy as a success, due to its high level of engagement from teachers who gained skills and certificates through completing the training courses. An additional project staff member articulated that the Whizz Education online course for maths teachers (which also provided certificates) were a success. However, these statements were contradicted by another project staff member. They explained that, during school closures, teachers travelled to remote locations where smartphone access and connectivity was relatively low. The staff member therefore estimated only around 50% of teachers could access the online training course. Camara, too, provided support to teachers during school closures via mobile phone support and an email address in order to distribute support materials and communication, but recognised that the cost of data bundles was the biggest challenge to these initiatives. They therefore ran a promotion to reimburse teachers for the cost of data.

Project data provides an indication of the uptake and impact of online teacher training during this period. [NB. Jigsaw has been unable to corroborate the findings of this analysis which were conducted by iMlango, due to a lack of available data]. It reveals that 91% of iMlango schools (182 of 205) had at least one teacher enrolled onto at least one CLA (Camara Learning Academy) course. However, only 67% of iMlango schools (138) had at least one teacher who had completed a minimum of one course. Indeed, between Year 4 and Year End 2021 (April 2020-March 2021), only 10% of teachers from iMlango schools had enrolled onto three or more micro-courses, significantly below the project target of 25%, which may be a reflection of the challenge of accessing or financing a device outside of school.

The data suggests that the impact of teacher training was also mixed, although this may have been impacted by the enrolment of non-Mlango teachers who had never before received ICT training (during school closures, both teachers who had received face to face training and other subject teachers in the school were targeted and encouraged to participate on the CLA platform to develop their skills). Between Year 4 and Year End 2021 (April 2020-March 2021), 60% of the teachers who were enrolled onto training courses (a total of 2480) achieved more than 70% after completing an end of course assessment on micro-courses - below the target pass rate of 70%. It is noted that this missed target may reflect the number of general subject teachers (many of whom had previously not received any ICT training) who were encouraged to take the iML-01 module (Introduction to ICT). This particular module had a pass rate of only 47%, whilst other modules (with lower overall enrollment) had higher average pass rates of between 71% and 85%. Therefore the data appears to have been skewed by the influx of teachers who may have never had any prior ICT training and were targeted and completed CLA during the last year.

4.4.3 WhatsApp and printable materials

The communications platform, WhatsApp, was utilised during the Covid-19 school closures to facilitate learning activities amongst teachers, students and parents. The findings below reveal the uptake of WhatsApp, as well as its usefulness as a remote learning resource.

Uptake of WhatsApp

The use of WhatsApp during the Covid-19 school closures appears to have been fairly varied. In total, 20 of 66 participants directly mentioned WhatsApp in KIIs as a resource which was used during this time (5 HTs, 2 students, 7 teachers, 6 PS). It is unclear whether this was always an activity initiated by iMlango: three participants (2 headteachers, 1 student) said that a WhatsApp group was set up by the school, whilst another three (2 headteachers, 1 teacher) claimed it was created by iMlango staff. The target demographic of these groups was outlined by two project staff: BoM members, headteachers, MoE staff, parents, and teachers.

However, lack of access to a smartphone - whether due to its expense, due to it being used by parents, or due to faulty technology - was found to be a significant barrier to using WhatsApp for lots of participants (3 HTs, 1 student, 3 teachers, 3 PS). One headteacher, for instance, estimated that of 300 parents, fewer than thirty were in the WhatsApp group, and another stated that only around 40% of parents had smartphones. Indeed, although one staff member

outlined that there could be up to 60% uptake of WhatsApp content from parents, two staff members reported that the support was extremely varied and overall engagement was low.

Effectiveness of WhatsApp

The way in which WhatsApp was utilised during the school closures varied. This is to be anticipated because of the high degree of dependence on the motivation and capacity of the individuals using the service. Three project staff members outlined the main approach taken through WhatsApp was sending daily worksheets to teachers, who would subsequently forward this content to parents and students. Interview participants referenced a number functions it served, including:

- To share learning materials and other information (9)
- To encourage and help students to use the iMlango app (2)
- To send information to and train teachers (1)
- To encourage parents to download learning materials at cyber cafés (1)
- To assist teachers in navigating the app and distributing content (2)
- To engage teachers in marking worksheets (1)

The two students who referred to WhatsApp in their interviews said that it was a helpful and effective way to receive learning materials (notably, neither of these students had heard of the iMlango app). Two benefits of these worksheets were provided by project staff members: they were aligned with national radio and TV lessons, enabling children to build on the learning (1); and the content was delivered appropriately, such as worded problems being specifically targeted at parents and students. These benefits led one staff member to articulate their feeling that engagement with WhatsApp was a more successful approach than the app.

4.4.4 Commentary on project design and delivery of outcomes

Unlike the impact of original project activities, the iMlango response to Covid-19 school closures was found to result in limited demonstrable impact. The design of the response relied heavily on access to smartphones, which was found to be a significant limitation, particularly in relation to on-going access for the most marginalised within the student population. As a result, there was overall limited uptake of the Covid-19 app and the dissemination of learning materials and coordination via WhatsApp.

However, it should be noted that, when accessed, the learning content provided was reported to have some positive impact. Five KII participants stated that students who accessed learning materials and teaching not only found it helpful but improved during that time in comparison to their peers (2 students, 2 HTs, 1 teacher). There was also a student who mentioned that the online content was relevant to what she had been studying. Moreover, the survey provided self-reported evidence of learning gains. 90% of students believed that they had progressed despite school closures, while 8% disagreed. However, as is outlined in chapter 5.2.4, headteachers reported learning loss during this period, so these self-reported gains are not entirely consistent with the entire dataset. Indeed, half of the Standard 8 students who were surveyed (50%/15 of 30) stated that they were worried about their progress prior to returning

to school (this was not statistically tested as the frequencies were low). The overall percentage amongst all students was slightly lower: 35% were worried about returning to school due to being behind, but the majority of students didn't think so (63%). A report by Whizz Education, which measured the impact of Covid-19 on learning in rural Kenya, supports these self-reported findings. It outlines that 53% of students exhibited a decline in their Maths Age (level of maths knowledge) during the period of school closures, which averaged at 1.1 years (or 13 months) of learning loss.[6] [NB. Jigsaw has been unable to corroborate the findings of this analysis, due to a lack of available data].

Furthermore, qualitative self-reported comparisons between iMlango and non-iMlango schools during this period emphasises the perceived mixed impact of the project's Covid-19 response. When students were asked to compare the level of support they received, the most common answer was that other schools were not provided with the same amount of teaching or materials (4). On the other hand, three student participants stated that other students in the community did receive a similar level of support from their teachers during school closures. Two student interviewees also noted that high schools provided online teaching, when primary schools did not, and another indicated that only students from a local private school had benefited from online learning. The students' comparison of iMlango and non-iMlango schools, therefore, was mixed and lacking in clarity.

The few adult interviewees that made this comparison, however, provided more cohesive observations. One headteacher reported that students from iMlango schools formed peer-to-peer learning groups during school closures, which was not the same as at other schools. Similarly, another headteacher commented that no other institution or programme would have engaged their students if it were not for iMlango. Finally, a MoE official asserted that iMlango had provided a platform from which students could learn during Covid-19. He stated:

> *So I think they had a head start by having the knowledge on iMlango, so when others had difficulties in accessing learning materials from the laptops and the internet, I think kids from these schools had minimal problems, if any. (MoE official, KII).*

Thus, although some consider that iMlango provided a benefit during the 2020 school closures, only a small proportion of students were able to access these benefits. Indeed, six students (40% of the interview sample) reported that they did not receive any support - neither from iMlango nor their school - during the time they were at home. Additionally, two MoE officials stated that they were unaware of any activities or did not see any taking place. Within such a rapid and complex crisis, it is difficult to determine whether iMlango could have achieved more in its response. However, the reports of limited access and awareness do remain of concern and suggest that there were significant limitations in the approach adopted. This is worthy of on-going programme reflection as outlined in chapter 9.

[6] Whizz Education (2021). *Measuring the Impact of Covid-19 on Learning in Rural Kenya.* https://www.whizzeducation.com/wp-content/uploads/Kenya-Covid-Impact-SCREEN.pdf

Additional contributing factors

Beyond iMlango activities, it is helpful to consider the impact of other contributing factors to learning during school closures. Only a small range of non-iMlango initiatives were mentioned by interview participants. These were:

- MoE lessons which were broadcast on television (2)
- The provision of psychological support for students, organised by the Catholic Church (1)
- Conducting Nyumba Kumi training (teaching under trees), as directed by the government (1)

On the other hand, household factors were reported to have a particularly significant impact on learning. The vast majority of students felt that their family had supported them during this period (94%) while 5% disagreed, and this finding did not vary greatly across all disaggregating factors. Moreover, 92% of students felt they had enough time to complete school work at home, while 7% didn't. Within this finding, students from Type A/C schools were more likely to report that they had enough time than others from Type B schools (LO = 1.042, p= 0.025).

Correlations were also found between student absenteeism and learning progress during Covid-19 school closures. Students who reported missing school for more than a day in normal school terms were less likely to feel supported by their parents during school closures (p=0.026) or having enough time to finish school work at home (p =0.013). Conversely, those who missed school for less than a day were less likely to worry about returning to school because of a lack of progress during closure (p= 0.022). These correlations seem to indicate the impact of demographic factors on students' learning, as those students who were more likely to miss school during normal school terms were more negatively affected during Covid-19 school closures (more information can be found in *Table 12*).

Table 14: Correlations between school closure and attendance (time spent absent from school)

Factor	Correlating factor
	Attendance
Parent support during school closure	Negative (more than a day)
	LO = -1.314; p = 0.026
Enough studying time during school closure	Negative (more than a day)
	LO = -1.35; p = 0.013
Worried about progress during school closure	Negative (a day or less)
	LO = -0.591, p = 0.022

4.5 Conclusion

To conclude this chapter on the impact of iMlango activities, the following section offers a summary of the main findings within a contribution narrative: a summative analysis of the extent to which the project's Theory of Change (ToC) held true and to which iMlango activities led to the anticipated outcomes of learning and transition (the outcome of sustainability is explored in chapter 6).

According to the ToC, there were thirteen original project activities leading to five specific outputs (see Annex 6). The findings of this chapter suggest that, of these, two outputs were achieved more clearly than the other three, although there were positive impacts of project activities in each case, as outlined below.

There were some clear improvements in teachers' knowledge, skills and attitudes in using ICT for teaching and learning (output 1). The iMlango portal and content was found to be a key activity in achieving this. Interview respondents articulated that ICT made teaching easier, and there were indications that the content enabled teaching to become increasingly learner-centred. Likewise, in-field support was an important activity, with training identified as a crucial means to increase teacher engagement with technology and the support of field officers likewise being mentioned as a helpful resource. The impact of establishing iMlango champions was less clear, but overall was deemed to be a positive activity (although this was rarely discussed in relation to teacher practices).

Likewise, project activities appear to have clearly contributed to improved individual engagement with iMlango resources by girls in primary schools. The learning content (including Maths-Whizz) was identified as a vital contributing factor both to student performance and enjoyment of learning. Similarly, the ability to access technology and connect to the internet was said to contribute to students' improved digital literacy - an outcome of the project which was frequently identified as a key benefit - although a lack of connectivity and ICT maintenance were also found to be barriers to learning, as outlined in chapter 5. The use of timetabling policies, on the other hand, was rarely mentioned by interview participants, but there was some indication that school management had embraced the project by integrating ICT lessons into school timetables and encouraging teachers to utilise the available resources.

The findings suggest a comparably more mixed success of the remaining three outputs. Although the implementation of an attendance monitoring system was identified as a key contributing factor to improved student attendance, there is little evidence that it contributed to output three: reduced financial barriers to education through the delivery of microloans. The microloan scheme itself was viewed differently across interviews, with school-level participants noting the importance of financial assistance for enabling families to send their children to school, whilst project-level interviewees were more reticent about the initiative's success. Output three was therefore not clearly achieved by the project.

Output four (improved girl engagement in girls' clubs) should be considered on two levels. On the one hand, the survey provided self-reported data of a relatively low reach of the girls' clubs (17% of the students claimed to be members). However, girls' clubs were overwhelmingly viewed as a positive activity, contributing to girls' confidence and self-esteem, as well as

providing a wide range of other life skills. It is true that little mention was given to training and support of girls' club mentors, but the positive impact of girls' clubs should be recognised, even if the evidence of their improved reach is less clear.

Finally, there were mixed results for output five: improvement in key stakeholder engagement to enable sustainability of girls' progression through education. The findings revealed the engagement school governance figures at both the school-level and county-level. The provision of data reports was considered to be an important resource for school management, who were reported to learn from and act upon this data. Leadership training, on the other hand, was found to be lacking, particularly due to staff turnover: the continual sensitisation of headteachers was identified as an area which would have been particularly beneficial, in order to improve leadership buy-in. Therefore, there was evidence of stakeholder engagement, but the findings suggest that more focus was required on this output, as will be further discussed in chapter 6: sustainability.

In spite of these mixed findings related to the ToC's outputs, there were clear indications that all intermediate outcomes (IOs) were met. The findings of this chapter evidence that attendance improved (IO1), the quality of teaching increased (IO2), that girls made learning progress (IO3) and gained life skills (IO4), and that there was an increased use of iMlango reports by school-level stakeholders to inform their decision making and actions (IO5) - although perhaps less evidence that these reports were used by other key stakeholders.

In conclusion, the evidence suggests that original project activities have, on the whole, led to improved learning outcomes. It is important to recognise that the self-reported nature of this evaluation's findings (due to constraints on data collection) cannot provide conclusive evidence of causality, but there are clear indications that iMlango activities had positive outcomes for students' learning and attendance, gender equality, teaching quality and life skills. There were other contributing factors (such as additional stakeholders and demographic factors) which were found to have contributed to learning outcomes, but the impact of iMlango activities is notable enough to attribute the project's overall contribution. However, it should be noted that the ToC's assumption that "county-level officials and schools take initiative in project ownership" was an outcome which original project activities were not found to achieve.

In terms of transition, there is insufficient evidence to assess the extent of iMlango's contribution. Although the findings suggest a high level of aspiration to transition to secondary school, no firm data were available to confirm the extent to which iMlango project activities contributed to this outcome, nor to achieved transition.

Understandably, the response to the Covid-19 school closures was not outlined within the project's original ToC, so cannot be assessed against that framework. However, an assessment of the activities which took place during that period found there to be limited demonstrable impact. Lack of access to smartphones was a significant limiting factor, resulting in poor uptake of the app and WhatsApp communications. Moreover, the success of teacher training and involvement in project activities during this time provided mixed findings. As a result, despite some partial indications of learning progress (primarily among those who had access to technology at home), iMlango's response to Covid-19 was not found to build upon

pre-pandemic learning outcomes. In particular, it was unable to reach the most marginalised of the student population. Further discussion of these findings is offered in chapter 9.

Chapter 5: Analysis - Barriers to learning and transition

5.1 Introduction

This section presents findings related to potential barriers to learning (5.2) and transition (5.3) within and beyond the iMlango project activities, including barriers related to Covid-19. Findings in this section relate to the following research questions:

Table 15: Research questions related to barriers

RQ #	Research questions
Research theme 1: Pupil learning and transition	
1.1	**Learning outcomes:** To what extent are numeracy and literacy learning level improvements seen? What are the key drivers and barriers to learning?
1.2	**Transition:** To what extent have the project interventions influenced girls' transitioning through key stages of education, training or employment?
1.4	**Enrolment and attendance:** What difference has iMlango made to enable marginalised girls to enrol in primary/secondary school and to frequently attend school? What has re-enrolment looked like in iMlango schools?
1.5	**Technology:** What do the literacy content and Maths-Whizz tutor add to the learning in the classroom? Do they support learners to develop their understanding of literacy and numeracy in ways that are not possible in their ordinary classroom?
Research theme 2: Teacher and school leadership practices	
2.1	**Teaching quality:** To what extent has the project been successful at improving the quality of teaching in targeted schools? What factors have contributed to or hindered this?
Research theme 4: Project design and delivery	
4.1	**Covid-19 response:** How successfully has iMlango adapted its activities to respond to the impact of the Covid-19 pandemic? What is the impact of the app usage for active users? What barriers exist to using and engaging with the app? To what extent have the activities conducted during the crisis (teacher training, TLM dissemination) solidified the benefits of iMlango? How, why and to what extent have teachers been engaged in remote learning strategies during the Covid-19 period? How successfully

	has the project supported the continuous professional development of teachers during school closures?

The section closes with a contribution analysis of the changes to barriers outlined (Section 4.5), including whether the expected outcomes in the original Theory of Change have been observed and the extent to which the project has contributed to them.

As discussed in Chapter 3 and 4, due to the disruption of Covid-19 on project activities and in-person data collection, no formal measurement of learning outcome or cohort tracking (transition) was possible. However, original section headings were retained below and relevant findings in other types of data (surveys and interviews) related to barriers are included to provide an indication of changes which occurred during the lifespan of the project.

5.2 Barriers to learning

This section focuses on relevant findings on the barriers faced by marginalised girls to learning. It should be noted that the decision was taken to not conduct a learning assessment for the endline - because of the complexities of travel restrictions and data-collection from Covid-19 - and so it is not possible to make confident assertions relating to learning outcomes. Other than barriers to learning content, discussions on barriers to enrollment, attendance, and technology are also included here. Covid-19 and the disruptions it has caused to learning and other related activities are addressed at the end of this section.

5.2.1 Barriers to learning outcomes

Due to the iMlango focus on ICT, barriers to learning outcomes in the data were often framed in relation to the technological interventions provided by the project. This section focuses on barriers concerning the learning content (as opposed to the infrastructure and hardware, which is covered in 5.2.3 below), that is, the iMlango content in general, and specific components such as the Maths-Whizz tutor, and literacy content (including Longhorn). Additionally, barriers related to learning outcomes outside the project interventions were identified, such as personal factors relevant to the students themselves (e.g. disabilities, family influences) and potential issues on teaching and teacher training.

Barriers to learning content

Both quantitative and qualitative data has uncovered potential barriers preventing students from accessing the learning content and since relevant discussion on quantitative results has been covered in Section 4.4.1 above, this section will concentrate on results from KIIs.

In particular, two project staff members mentioned the literacy components of iMlango were not as strong in comparison to the numeracy component (this is in contrast to positive attitudes towards the content, as outlined in chapter 4.2.2). Two main themes were identified: the specific literacy content and its position within the broader iMlango project. Project staff members reported that the literacy content: was not useful to students revising for exams

unlike Maths-Whizz content (1), lacked activities, particularly additional follow-up stories (1), did not align as well with the national curriculum as Maths-Whizz did (1), and lacked a component showing the progress of students unlike Maths-Whizz did (1). Moreover, within iMlango more broadly, it was mentioned that there was a lack of clarity as to where the literacy components belonged (1 PS), and that staff did not possess a full understanding of how to prepare schools and learners to adopt the literacy content as it was introduced later whereas this understanding existed for maths components from the beginning (1 PS). The adaptive nature of the Maths-Whizz learning content was therefore found to be more beneficial in comparison to the non-adaptive literacy content: the former offered more opportunities to respond to learner needs and provided progress reports, due to the integration of differentiated learning and real-time monitoring.

Furthermore, as internet connection was needed to access the full benefits of Maths-Whizz, project staff members have also discussed that ideally Maths-Whizz content should be accessible both online and offline (2) or using a blended online and offline approach for when connectivity is not available (1), and this would have allowed students better access to the benefits provided by Maths-Whizz.

Additional barriers

Apart from project activities and the learning content, two types of additional barriers were identified: demographic factors specific to certain students and potential issues with teacher training and teaching quality. These are addressed here.

According to the student surveys, disability was found to be a significant predictor for reported learning progression: girls with disabilities were less likely to have progressed in the past year than those without disabilities (odds ratio = 0.26, $p = 0.021$). This suggests that, although GwD were said to have benefited from the integration of ICT in the KIIs (as outlined in Chapter 4.2), there is still more work to ensure that they are not left behind in lessons.

The limited knowledge transfer to teachers and three potential reasons were mentioned by project staff, as this impacted teaching quality which further affected student learning. Firstly, the transfer of teachers away from iMlango school prevented further knowledge transfer (to other teachers and students) (2 PS). Secondly, the training of at least one teacher per school was a challenge, as mentioned by a project staff member, and this resulted in not all schools possessing teachers with sufficient technical expertise for their knowledge to be shared. Additionally, although two project staff expressed that most teachers have embraced using ICT, three identified that initially not all teachers were supportive of the training. The main reasons cited for this were:

- Teachers were focused on completing the syllabus instead of trying to incorporate Technology into lessons (1)
- Teachers did not feel the iMlango project was helping them (1)
- Teachers did not understand the relevance of the literacy and numeracy content to learning (1)
- Teachers were not used to participating in professional development outside of school hours (1)

5.2.2 Barriers to enrolment and attendance

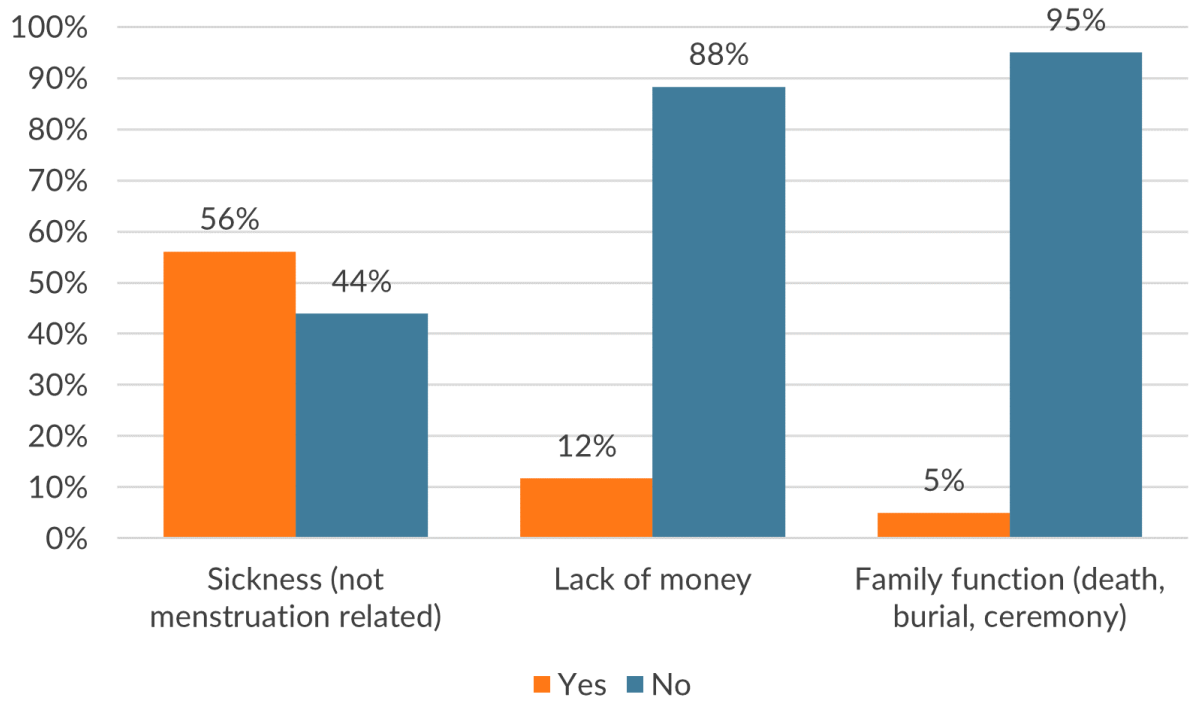
Specifically regarding student enrolment and attendance, several main barriers beyond project activities were discussed in different types of data including both personal demographic barriers (location or school year) and family barriers (educational or socioeconomic background). These barriers to attendance in terms of absenteeism (missing school occasionally, as opposed to dropping out of school long-term) are investigated here, while Section 5.3 will discuss barriers related to school dropout and transition.

In the student survey, 36% (139) of students reported that they would not miss school for any reason and among these students, those from Uasin Gishu were significantly more likely to keep attending school even when faced with challenging personal circumstances ($p < 0.001$) in contrast with all other counties. Other than location as a potential barrier to attendance, students' Head of Household's educational attainment was a good predictor in how resilient students were when facing potential problems in attending school: students whose HOHs had received little to no formal education were more likely to miss school whereas those with more educated HOHs stated that they would not miss school for any external reasons (p values vary by educational levels; for those with higher education degrees, $p = 0.002$).

Furthermore, earlier analyses show that only 61% of students did not miss school in a typical week while the rest of the students missed school for various periods of time (hours to several days per week). Due to the categorical nature of the time when students are absent from school, multinomial logistic regressions were used to test for statistically significant barriers. The analyses confirmed that both grade and location were potential barriers: Standard 3-4 students were more likely to miss school for a day or less ($p= 0.005$) in comparison to Standard 8 students, and again those from outside Uasin Gishu were significantly more likely to miss school for a day or less ($p =< 0.001$). Family educational background was also present in the quantitative analysis on the time students spent absent from school. Students whose HOHs have no formal qualifications were more likely to miss school for more than one day in comparison to those with highly educated HOHs ($p = 0.034$).

For students who missed school, the top three reasons were: non-menstruation related sickness (56%; 215), lack of money (12%; 45), and attending family functions (5%; 19) (*Figure 15*). These top reasons for missing school also affected students differently depending on their school locations: students from all three counties outside Uasin Gishu were more likely to be affected by non-menstruation related sickness ($p<0.001$). Students from Kilifi were more likely to be affected by a lack of money ($p<0.001$). No effect was found for the reason 'attending family function' across different disaggregating factors, suggesting that students were equally likely to miss school when family functions such as funerals were held.

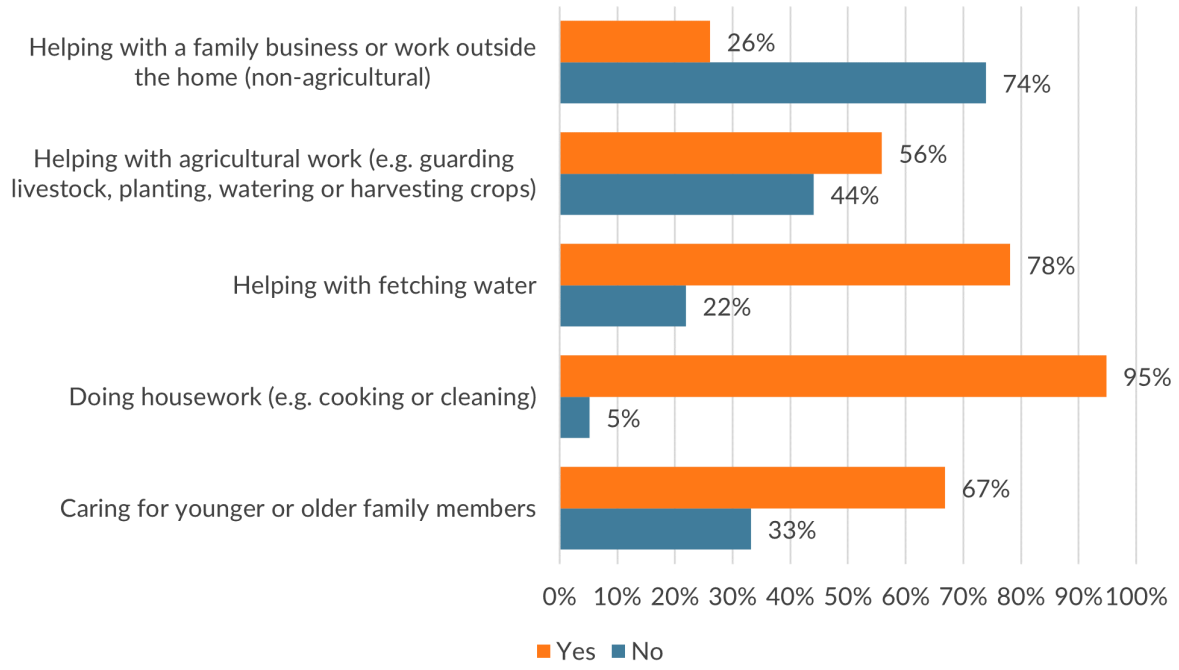
Figure 15: Student survey responses to the question 'What stops you from attending school?' (top 3 reasons)



Total number of respondents: 383

Students' engagement in economic and/or domestic activities was also mentioned as a potential barrier to attendance. One headteacher interviewed noted that school attendance was significantly lower on market days (reducing from over 95% to as low as 81%) due to students engaging in economic activities (e.g. helping with business) on those days. Children's involvement in other chores such as housework or caretaking was also investigated in the survey by asking if they would normally spend time on doing house chores instead of attending school. Only two out of 383 students did not spend time doing chores at all while the rest of them (99.5%) spend some time doing various types of chores. Despite the additional responsibilities, only 2% of students (7) reported that doing chores would sometimes stop them from attending school as much as they wanted, while the majority managed to still attend school (98%). Regarding the specific types of chores students engaged in, it was reported that 95% (363) of students would spend time doing housework (e.g. cooking or cleaning), followed by 78% (299) helping with fetching water, 67% (256) caring for younger or older family members, 56% (214) helping with agricultural work and 26% (100) helping with a family business or work outside the home.

Figure 16: Student survey responses to the question 'Do you spend time doing any of the following (chores)?' (top 5 types of chores)



Total number of respondents: 383

More broadly, family influence was also said to act as barriers in KIIs. Two out of 14 project staff further discussed the influence of families on children's education at home, particularly during school closures. One staff member highlighted that family pressures could prevent children from learning at home. The reasons cited for this were:

- Children were needed to help with chores and so did not have time to work at home.
- Economic pressures on parents created barriers to education as income generation was prioritised.
- Families were unable to afford electricity and lighting which prevented home learning in the evening.

5.2.3 Barriers to technology

As Section 5.2.1 above has covered barriers regarding technology and learning content, this section presents findings on potential barriers to technology and more specifically, barriers related to hardware and infrastructure that could potentially have impeded the impact of iMlango. These cover the main barriers such as the lack of equipment, internet access, broken equipment and slow maintenance, and electricity shortages.

The reported lack of equipment such as computers and projectors in some schools was one main barrier to accessing iMlango content, as identified by teachers in KIIs (3). They expressed that there was inadequate time for students to access computer labs, due to the big student population in their school and the relative lack of equipment. One teacher reported that this meant each class could only use ICT labs once or twice a week, with an additional teacher

expressing that more access could only be achieved outside of timetabled access. Moreover, one teacher mentioned that accessing labs was more difficult post-Covid-19 as social distancing further reduced the number of students they could accommodate. This barrier was also discussed by project staff, especially for the Maths-Whizz Tutor content that was only accessible online through ICT labs.

There were a number of recurrent technology-related issues or challenges reported by participants. Most commonly mentioned was the ratio between the number of students in a class and the number of computers available (11 mentions: 6 teachers, 2 students, 2 MoE, 1 BoM). Respondents stated that there were too few computers for all students to have access and/or that the computer lab itself was too small a room to fit an entire class. There were a couple of ways the interviewees said they had tried to mitigate this challenge: using projectors was said to address the lack of access (3) and two teachers mentioned that they had adjusted the timetable or utilised free time to enable students to gain access.

Additionally, challenges with internet connectivity was cited as another barrier. Several interviewees stated that the network was intermittent, sometimes weak and sometimes cutting out, which affected learning in the computer labs (2 teachers, 1 HT, 1 MoE). More common, however, was the comment that the network had not been working at all in recent months. Eight respondents (from across all four counties, and from six schools between them) reported that they had no internet connection at the time of interview. Two interviewees elaborated that this had been the case since September 2020, one that it had been the case since Covid-19, another since returning to school, and one thought that iMlango had withdrawn internet connectivity altogether. Because of the limitations of the data collection, it has not been possible to ascertain how widespread these challenges have been, but it is clear that it is more than an isolated incident since schools reopened.

Four project staff members said the broadband was good quality and more than sufficient for the equipment provided. Only one project staff member thought the broadband was insufficient, although another staff member identified that Type B schools could have had more equipment to take advantage of the quality of broadband provision. The main issue with the broadband, identified by the four project staff, was that its provision was limited in range to only 1 or 2 rooms, and not across the whole school. This reduced the time that teachers and learners could access and engage with online content, as it could only be accessed near ICT labs. One staff member reported how this led to students in smaller schools accessing online content more regularly than their peers in larger schools, meaning students across iMlango schools did not receive equal exposure to the online content.

A third barrier mentioned by eight participants was that the devices had broken or needed maintenance (3 BoM, 2 teachers, 1 HT, 1 MoE, 1 student). One project staff member also identified that the capacity building of teachers to fix technical issues only occurred for small technical issues rather than large ones. As a result some schools remained dependent on external maintenance. The issue of electricity shortage was reported as another barrier to technology. Six participants commented that blackouts had impacted on the ability of schools to use the computers (4 teachers, 1 HT, 1 MoE), and on two occasions this was linked to the high cost of electricity leading to a pile-up of bills. Additionally, two participants mentioned theft as an issue, leading to a loss of projectors and computers (1 HT, 1 MoE).

5.2.4 Covid-19 school closures

School closures were identified as a hindering factor as they led to learning loss in both the surveys and interviews. Among 383 students surveyed, 12% of students (45) reported that they were doing worse at school the current school year in contrast with last year, and 29% (13) of them quoted 'school closures during Covid-19' as a reason.

When interviewed, three headteachers argued having schools closed for such a length of time during Covid had led to learning loss. One headteacher explained that it was difficult to keep children engaged during this period, and another headteacher expressed that children had forgotten previously learned content and performed poorly when they arrived back at school. Additional barriers identified during school closures include: girls' clubs and their benefits stopping during school closures (one teacher), and children not being able to access storybooks because of school closures (one student). Although one headteacher felt there was no learning loss during school closures, the emerging theme was that school closures led to some learning loss. This was summarised by a headteacher who expressed: '*Academic gains made by the children were completely eroded during that period [school closures]'. (Headteacher, KII).* Additionally, it should be noted that one teacher reported that learning was inhibited as students supported their parents in conducting business at the market during school closure (see Section 5.2.2 above for more discussion on students' engagement in economic activities as a barrier to attendance generally).

5.3 Barriers to transition

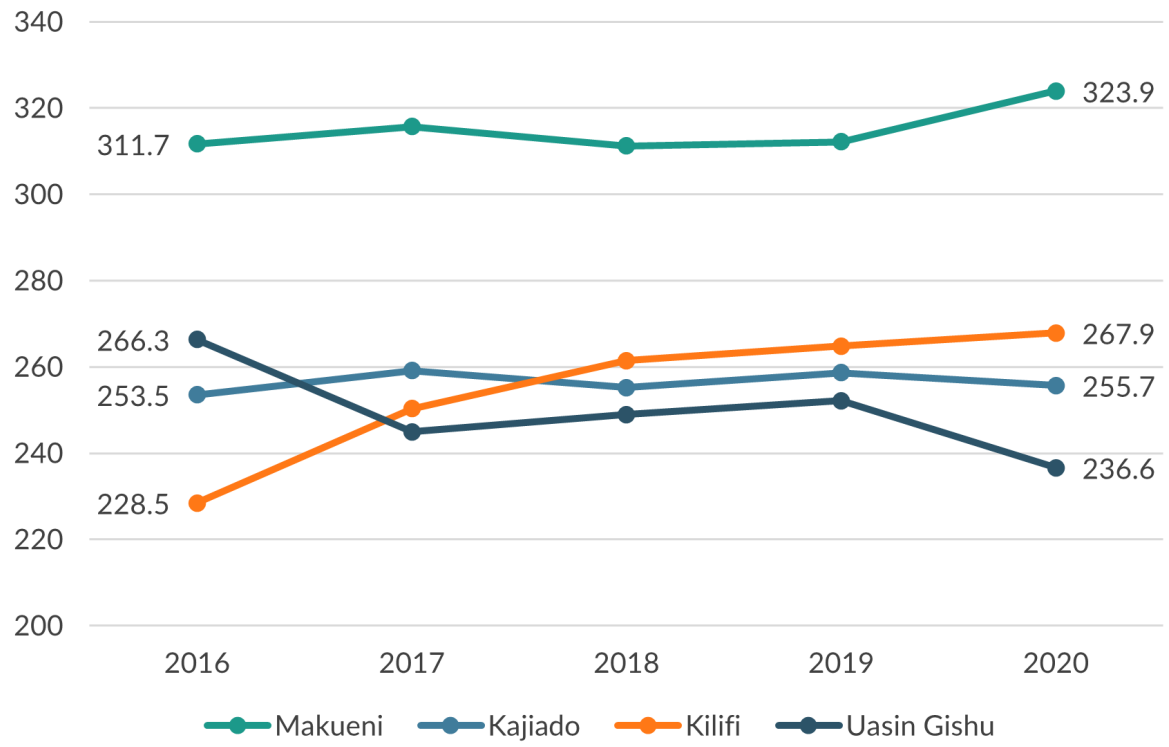
This subsection includes relevant findings related to the barriers faced by marginalised girls to transition. As no cohort tracking was conducted, the following analysis on student transition mainly relied on survey data, the mentioning of transition and/or dropping out in the interviews and average KCPE results reported by 28 sampled iMlango schools (note that this included both boys and girls as the data was not disaggregated by gender: see Section 3.3 for details on the data).

Poor KCPE scores was identified in the project ToC as a barrier to transition, so school-reported data on students' average total KCPE scores was analysed (individual subject scores were discussed in Section 4.2.1). This is to understand how, on average, students from different schools and counties had performed through the years by comparing the average KCPE 2020 results with those from 2016 (where available, as some schools did not take KCPE in 2016 or did not submit data). Similar to the patterns observed in the average English and maths scores, students' overall scores varied across different schools and counties with some schools and counties improving and others declining.

Specifically, according to the average total scores from all four counties (*Figure 17*), three out of the four counties consistently achieved average scores below 270 (out of 500) while the average KCPE scores from Makueni were the highest among the four counties in all years at above 310. Makueni county as a whole also showed an improvement of 12.24 points over the years. Mean scores in Kajiado and Kilifi have also seen some increase from 2016 to 2020, with the former improving an average of 2.16 points and the latter, a more significant increase of

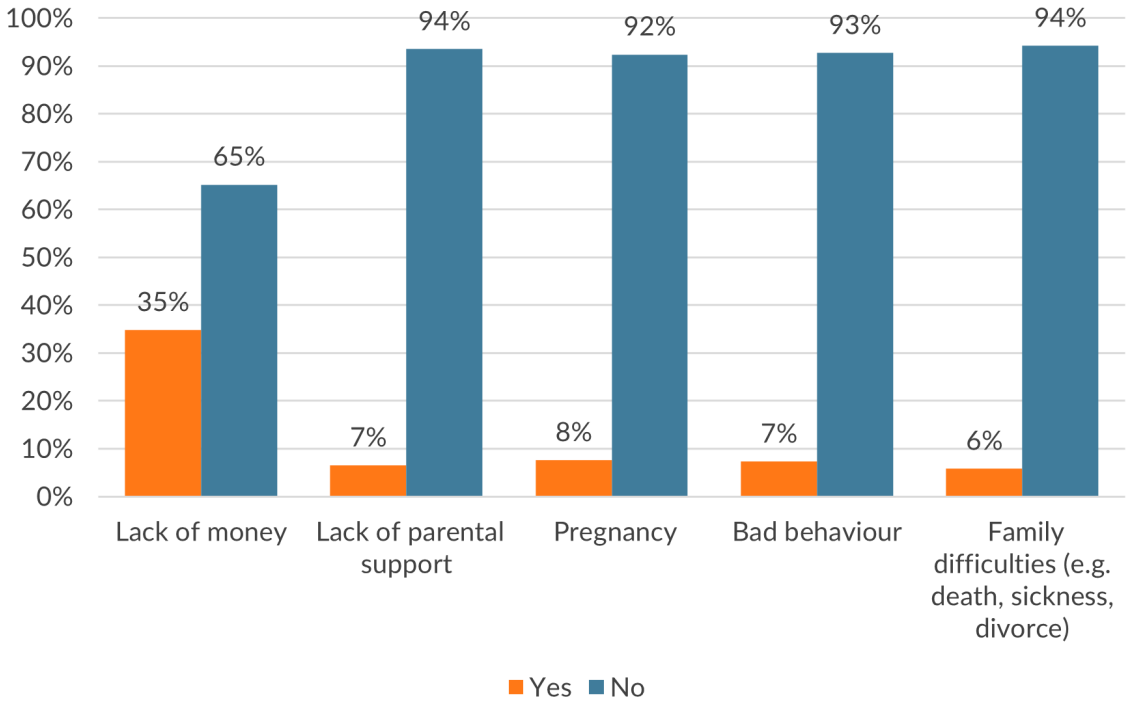
nearly 40 points. Lastly, Uasin Gishu was the only county showing a decrease in total scores (by 29.69), dropping to the bottom of the four counties from second back in 2016. At individual school level, all but 12 schools showed an improvement in total KCPE scores with all eight schools in Uasin Gishu reporting a decrease of average scores (from 12.23 to 61.02).

Figure 17: Average total KCPE scores by county (2016-2020)



In student surveys, relevant questions on reasons that would stop students from completing their studies were asked (*Figure 18*). Despite half of the 382 students (one did not answer the question) stating nothing would stop their progression in education, 35% (133) cited a lack of money as the main concern, followed by pregnancy (8%, 29) and bad behaviours (7%, 28). Lack of parental support (8%, 29) and family difficulties (illness, death, etc.) (6%, 22) were also included as the main reasons.

Figure 18: Student survey responses to the question 'What things might prevent you from completing your studies?' (top 5 reasons)



Total number of respondents: 382

The results also suggested that these potential reasons for dropping out of school varied among students. 70% (21 of 30) of Standard 8 students gave 'lack of money' as a reason for dropping out, in comparison, fewer than 40% of the students from any other age group reported this as a reason (X^2 (4, 282) = 18.877, p < 0.001).

Similarly, no specific references were made to barriers which would prevent future transition to secondary school in the KIIs but students mentioned potential barriers to continuing education in general (also see Section 5.2.2 on barriers to attendance which are likely to influence transition too). While all students interviewed stated that they intended to stay in school and four students specifically stated that there were no factors which would prevent them from continuing to attend school, several potential barriers were mentioned (it should be noted that the majority of these were in reference to students more generally, rather than the participants themselves). These included the potential inability to pay school fees (5), keeping bad company (2), child abuse (1), FGM (1) and bullying (1). There were a number of challenges faced by different genders: for girls, the greatest barrier to attendance was said to be pregnancy (5) and for boys, drugs (4), crime (1), playing karate (1), circumcision (1) and indiscipline (1). More broadly, family influence was also said to act as barriers in KIIs. One headteacher mentioned that the relocation of families during Covid-19 had resulted in student dropout.

5.4 Conclusion

The conclusion will summarise the main findings of the section and outline the observed changes to barriers to learning and transition and assess the contribution of the project to these changes.

The Theory of Change outlined four main barriers to learning and transition that the project aimed to overcome through project activities: poor KCPE results, lack of tuition fees, pregnancies and early marriage, and lack of perceived value of education and aspirations (see Annex 6 for full Theory of Change). In addition, there are several other barriers to girls' learning and transition that were not included in the ToC, which are also discussed at the end of this section.

Regarding the four identified barriers, findings in this chapter, and Chapter 4, suggest a complex picture with different barriers being addressed to varying extents by project activities.

First, as no formal assessment of learning outcomes was conducted and very limited data was available in the existing dataset, it is not possible to directly confirm the effectiveness of project activities on improving KCPE results (see Section 4.2.1 for potential impact on this). School reported KCPE results were analysed instead and the data showed great variation in different counties' average total scores where Makueni averaged over 310 in each year but other counties only achieved scores below 270. Moreover, a comparison between results in 2016 and 2020 revealed some improvement of total scores in all counties (by 2.16, 12.24, and 39.41) apart from Uasin Gishu, whose students' average scores dropped nearly 30 points over the years. This indicates that poor KCPE results are likely to remain a barrier to learning, especially for students from Uasin Gishu, despite the overall improvement at some other schools and counties. Secondly, neither students nor educators have quoted a lack of aspirations towards educational attainment and continuing education as a barrier to girls' learning. Instead, both qualitative and quantitative data would suggest a positive change in participants' attitudes towards girls' education (see Section 4.2.6 for positive impact). Although, due to limited data on the direct contribution of project activities on this change in attitudes, it is not possible to pinpoint the impact the project has brought to reduce this barrier for marginalised girls. It is likely that the positive attitudes to education from students are at least partially influenced by the iMlango activities. Three additional barriers identified by the evaluation are closely related to the perceived value of education, although similarly no evidence was available to evaluate the projects' contribution towards combating the negative effects of these barriers:

- Students' Head of Household's educational attainment: students with less educated HOHs were more likely to miss school.
- Students' engagement in economic and/or domestic activities: students were often required to take on additional household responsibilities which hindered their attendance and learning
- Family influences (lack of support, deaths) were also among key barriers to students' attendance and transition.

Furthermore, the remaining two identified barriers (lack of tuition fees and pregnancies and early marriage) continue to be the main challenges to girls' education, frequently mentioned by participants in the data. Students often reported that a lack of money (for fees and school supplies) would stop them from attending school, affecting their attendance and transition. This suggests that despite the project's targeted interventions (e.g. microloans) which have resulted in positive impact on student attendance and transition (see Section 4.2.5 for the impact), directly contributing to the ease of financial barriers for girls' learning, further actions are needed to help caregivers to meet the ongoing cost of children's education, enabling students to remain in school.

Additionally, girls reported that pregnancy remained a significant challenge for their attendance and transition in both surveys and interviews, despite the project's interventions on life skill training (e.g. via Girls' Clubs; see Section 4.2.6 for positive impact). Again, as no targeted data was available to determine the extent to which project activities had contributed to this positive change, it is likely that various project activities, such as teacher training and GCs, have increased girls' awareness but more support is needed in the future to further tackle this barrier. It should be noted that no data was collected on the potential drivers of unwanted pregnancies, making it impossible to address the cause of this challenge; moreover, it is unlikely awareness has solely contributed to this challenge.

Across different datasets, some other barriers were also identified, but as these were not mentioned in the ToC, it is not possible to discover whether and how much project activities had contributed to or eased their negative effects on learning and transition. These barriers are therefore summarised below:

- Learning content: the literacy component of iMlango was weaker in comparison to the numeracy component both in its content and its implementation.
- Learning content: Maths-Whizz Tutor's dependence on the internet prevented more students from accessing it more often.
- Disabilities remain a barrier for student learning and progress during school closures.
- Teaching quality: limited knowledge transfer and professional development for teachers, together with some teachers' negative attitudes toward training further affected student learning.
- Technology (hardware and infrastructure): the lack of equipment (computers and projectors) and reliable internet access, broken equipment and slow maintenance, and electricity shortage were among the main barriers found to hinder student learning.
- Covid-19 school closures: students self-reported to have experienced learning loss during school closure, and most teachers voiced similar concerns for the lack of progress made during Covid school closure.
- Location: students from outside of Uasin Gishu were more likely to miss school
- Grade: students from lower grades were more likely to miss school for a day or less in comparison to Standard 8 students
- Other additional factors including non-menstruation related sickness and bad behaviours (e.g. drug use) were also among key barriers to students' attendance and transition.

Finally, it is important to recognise that changes in barriers to learning and transition are also influenced by other interventions targeting girls' education (outlined in Chapter 4). As such, it is not possible to attribute change solely to the project activities, however, there is emerging evidence that the project did contribute to change in these areas.

Chapter 6: Analysis - Sustainability

6.1 Introduction

This section presents findings related to the sustainability of the iMlango approach (6.2) and the Covid-19 response (6.3). It also includes the plans put in place to sustain the project and assesses their feasibility (6.4). At the chapter's conclusion (6.5), the main findings are summarised and discussed. Findings in this section relate to the following research questions:

Table 16: Research questions related to project sustainability

RQ #	Research question
Research theme 3: Project sustainability, VfM and scalability	
3.1	**Sustainability:** What mechanisms will enable the gains from iMlango to be sustained?
Research theme 4: Project design and delivery	
4.1	**Covid-19 response:** How successfully has iMlango adapted its activities to respond to the impact of the Covid-19 pandemic? What is the impact of the app usage for active users? What barriers exist to using and engaging with the app? To what extent have the activities conducted during the crisis (teacher training, TLM dissemination) solidified the benefits of iMlango? How, why and to what extent have teachers been engaged in remote learning strategies during the Covid-19 period? How successfully has the project supported the continuous professional development of teachers during school closures?

The chapter therefore provides a platform from which to assess the assumptions of the Theory of Change, broadly that project activities are sustainable after project conclusion, and will lead to continued learning and transition outcomes. This chapter will also assess the relevant assumption for sustainability that schools and county-level officials have taken project ownership.

Due to the Covid-19 school closures, the majority of original project activities were disrupted and were substituted. The success of these alternative initiatives are presented in Chapter 4.4, however the contribution of these initiatives in solidifying and sustaining the learning and transition improvements delivered by previous project activities are discussed here. This section draws solely on qualitative data, and the self-reported nature of the findings limits the extent to which conclusive judgements can be drawn about sustainability. Nonetheless, it provides an indication of the extent to which project activities can be continued.

6.2 Sustainability of the iMlango approach

This section will draw on qualitative data to examine the perceived sustainability of the iMlango approach, including valuable activities for sustainability in addition to the viability of the iMlango approach. The sustainability of iMlango within schools was a much discussed topic among interviewees. The overall trend to emerge was that the sustainability of iMlango is mixed, with some areas of sustainability but also many challenges. One project staff member summarised this, suggesting, as would be expected:

> *It's difficult to say the project will be sustained in schools. It will not be possible for it to be sustainable in the exact way we have delivered it. (iMlango staff, KII)*

Furthermore, when discussing overall challenges to sustainability, another staff member mentioned:

> *Each county has its own unique experiences, but share the same challenges. (iMlango staff, KII)*

As a result, when discussing sustainability it is appropriate to anticipate, despite the limitations of the data collection, that the challenges encountered are likely to be reflected in many iMlango schools. The following section will detail the perceived valuable activities contributing to sustainability, before detailing challenges the project faces in its continuation.

6.2.1 Valuable activities

This section outlines what the analysis indicates are the most valuable activities within the project, followed by the most valuable activities that enhance sustainability. Firstly, the school-level perceptions of valuable project activities are presented. The section then outlines the importance of certain project activities for sustainability, discussing teacher training and the implementation of technology and hardware in schools. This section then presents the sustainable value of interventions designed to shift gender roles, before finally presenting other factors and activities that have contributed to sustaining the project.

Headteachers, BoM members and MoE officials were all asked to identify the most valuable activities taking place in iMlango schools during KIIs, particularly before the onset of Covid-19. The most common answers are summarised below:

- Access to ICT devices and learning content, both for students and teachers (15)
- The provision of microloans or a voucher scheme (3)
- Girls' clubs (2)
- Teacher training and support provided by iMlango (2)
- Learning and attendance monitoring and data (2)
- Guidance and counselling (1)
- The provision of WiFi (1)

Access to ICT devices and learning resources for teachers and students was considered to be the most important activity to continue within iMlango. Project staff members discussed valuable activities in relation to sustainability. Three staff members outlined that overall,

low-cost activities that focused on knowledge, strategies, and empowerment are most likely to be sustained. Specifically, four aspects of the project were identified as representing valuable activities enabling sustainability. These are teacher training, the implementation of technology, gender-focused interventions, and community outreach: each is summarised in turn below.

Teacher training

Eight out of 14 project staff identified that teacher training activities delivered through iMlango will positively contribute towards the sustainability of the project. Within teacher training activities, three significant themes emerged. Firstly, it is considered that the knowledge delivered to teachers on using ICT and the learning content effectively in classrooms will be retained in schools as it has already been passed to teachers. This retention of knowledge is vital. Three MoE officials, one headteacher and one BoM member placed specific importance on continuing to train teachers, in order to prevent the gains in ICT literacy amongst staff and students being lost. Indeed, the turnover of headteachers was regarded as a key challenge to project buy-in (as discussed in section x), and one MoE official suggested that the increased sensitisation of headteachers was therefore an important consideration:

> [...] *during training of the other teachers, if the headteachers can as well be incorporated in the training, it will really help because the crop of headteachers I have are the old ones; they fear technology, but I am sure through trainings with their teachers, they will also embrace the programme and they will like it. (MoE official, KII)*

Secondly, teacher training was valuable in overcoming resistance to the project with most teachers now supportive of iMlango methodologies (2 PS). This has removed a significant barrier to actively maintaining iMlango methods of teaching in schools. Thirdly, the most common response among school level KIIs was the need for maintenance support (3 BoM, 2 HTs), which was outlined as a key challenge to sustaining the technical side of the project. Three project staff members indicated that iMlango delivered training that helped teachers to fix some technical equipment in schools with little support. This was identified as significant in helping to maintain hardware in schools after technical support provided by iMlango was removed.

Implementation of technology

Another major theme to emerge from the data is that introducing technology into schools has led to learning improvements that will be sustained (3 PS). As discussed earlier, introducing technology has increased engagement in learning, summarised by one staff member:

> *[...] if you want a kid to learn, hide the information in a gadget. (iMlango staff, KII).*

Two staff members expressed that this increased engagement in learning will remain with the hardware in schools. One staff member also expressed that the provision of technology gave an opportunity for marginalised children to access the content as alternatively they would not be able to afford the hardware. Learning improvements for all students will therefore be sustained for as long as the provided technology is accessible.

Interventions targeting gender roles

Seven out of 14 project staff articulated their belief that interventions specifically focused on altering gender norms and roles that were delivered through iMlango will be sustained. In particular, five staff expressed that the girls' club component is particularly sustainable and valuable. The reason cited for this was that they were a low cost element with locally available mentors, meaning almost all schools have the capacity to sustain this component. The continuation of girls' clubs was additionally proposed in school-level KIIs (2 HTs, 1 BoM). This was suggested to be particularly feasible, since it only requires the commitment of the teacher in charge. Additionally, girls' clubs were reported to have improved the self-esteem of girls which made them more likely to remain in school and so access iMlango learning (2 PS). Two staff members also spoke of gender interventions changing perceptions of gender roles within parents and communities, who now place greater value on girls' education and no longer see a girls' role as staying at home. One staff member identified the increased parental support for their daughters will help girls' performance in school, and generate sustainable learning outcome improvements for girls.

Additionally, one project staff member mentioned that training teachers and headteachers created a gender responsive environment in schools, which further explains the belief in the sustainability of teacher training activities. Another project staff member reflected that their own training on gender issues had been successful and they will carry the learnings forward.

Other valuable activities

Two project staff members additionally identified that increased and on-going community engagement will help to sustain the benefits of iMlango. Both staff members agreed that initially the project did not engage with communities as much as would have been idetal, but that introducing advisors in 2019 was a positive step and helped overcome community resistance to iMlango through raising awareness of its aims. This was recognised as a valuable change of approach improving sustainability opportunities (2 PS).

Students, too, were asked what activities would be most helpful to support their continued learning. No responses were especially prevalent amongst their answers, although three requested support for paying school fees and two asked for the project to provide uniform and/or shoes for students.

6.2.2 The perceived viability of the iMlango approach

The perceived viability of the project depends on weighing these valuable activities against challenges to sustainability, which are outlined in this section. Seven main challenges and important considerations for sustainability that emerged from the data are discussed. Challenges to the continued use of hardware and connectivity are outlined, followed by the consideration of continuing to finance the project. Then, challenges to delivering the valuable activities delivered by teacher training are addressed, before discussing the importance of engagement with governance systems. Finally, the viability of the consortium approach is assessed along with additional challenges.

Implementation of technology

Despite the introduction of ICT being perceived as one of the most valuable activities, KII participants also indicated that there were ways in which the dependence on technology also increased the challenges in sustaining iMlango activities. When discussing this issue, there were four main emerging themes among project staff interview responses. Firstly, the removal of technical support means schools will struggle to maintain hardware (2 PS). Specifically, staff identified that schools were reliant on advanced technological support and knowledge that school staff did not possess, for example the Ubuntu open portal requires a high level of technical knowledge to repair. As one staff member articulated:

> *[...]the removal of technical support from iMlango will ground some schools. (iMlango staff, KII).*

Secondly, two staff members reported that maintaining hardware and its usage will be difficult for schools without additional funding due to its costs. High electricity bills were also identified as a constraint (3 PS), with one staff member reporting that nearly 20% of the schools in their county are struggling to pay electricity bills. This illustrates the financial difficulties associated with sustaining hardware.

Thirdly, three project staff members expressed concerns about a lack of sufficient equipment moving forward. Providing only 25 computers per school was viewed as insufficient for the number of students (1 PS), and additionally schools have lost equipment through theft (1 PS). It is clear that this perspective regarding a lack of in-school hardware needs to be balanced with overall cost-effectiveness concerns: introducing more computers per school may have increased usage in some contexts but there is little evidence that lack of equipment is the primary limiting factor for project engagement. Another staff member argued using second-hand hardware has left schools with faulty or broken equipment at the close of the project, further increasing the financial burden for schools to sustain iMlango as they will have to either buy new hardware or undertake significant repairs on existing equipment.

Lastly, schools continue to face significant power challenges that disrupt learning through rendering technology inaccessible (1 PS). It was reported that schools could sometimes face up to 12-hour blackouts during the school day, once a week (1 PS). Investing in an alternative energy source, such as solar power or backup generators could have mitigated the impact of power cuts during the project (1 PS, 1 BoM).

Connectivity

In addition to technology challenges, connectivity issues could further inhibit the continuation of iMlango. Similarly to hardware, a significant number of schools will struggle to have the budget to continue to provide internet connectivity (3 PS). In addition, a substantial number of teachers and learners live in areas with poor connectivity, reducing the uptake of online content outside of school (4 PS). One staff member estimated that around 65% of children could access the portal at home. It is noteworthy that the technical support provided by iMlango had largely resolved connectivity outages in schools by the end of the project (1 PS), with the caveat that until 2018 a lack of technical expertise on the ground meant schools often

countered connection losses up to a term long (2 PS). The removal of technical support at the end of the project threatens that these issues will return.

Finances

Five project staff members outlined that schools will not have the financial resources to self-sustain the iMlango programme and would need to secure external funding to do so. As already discussed above, maintaining working technology and internet connection were identified by participants as particularly expensive components of the project that will be hard to sustain without on-going funding. Additionally, technical and educational FO's are a significant cost that many schools will struggle to maintain, in particular due to the dependence that schools have on the external funding required to facilitate the use of FO's.The issue of financing was also echoed in the school-level KIIs. Participants outlined key barriers to sustainability, which include three funding-related matters:

- A lack of finances to support electricity and Internet bills, and technology maintenance (4)
- Lacking the money needed to establish an income generating activity (IGA) to support the school (1)
- Being situated in a low-income community, compounding a lack of school funding (1)

A further two staff members outlined that the sustainable aspects of the project will be non-cost components, as all schools will be able to adopt and carry these ideas forward. Four project staff identified that some schools have IGAs that can help provide financial support to sustain aspects of iMlango. Therefore, sustainability varies from school to school, with one staff member estimating around 40% of schools have IGAs in place to sustain the project, although at a project level IGAs were only confirmed as being present in a few schools.

Teacher Training

As discussed earlier, iMlango has developed technical and pedagogical capacity within teachers successfully - for both numeracy and literacy - and this was viewed as a valuable component for sustainability. However, there are two main challenges to ensuring continuity of these enhanced practices and knowledge within iMlango schools. Firstly, teacher transfer removes this knowledge from iMlango schools (3 PS). In particular, the removal of champion teachers is problematic as they are vital for transferring knowledge to peers (1 PS). Two project staff further identified the time and difficulty in introducing new teachers to using technology. To ensure sustainability, it is therefore vital that teachers at iMlango schools who have been trained, and have the capacity to continue to pass this knowledge to other teachers, remain in iMlango schools after project staff have exited. Secondly, it was identified that the teacher training approach could have been improved in the beginning of the project, with one staff member arguing delivering training at a school level instead of a focal point county level could lead to better uptake of teachers owning the project. The project shifted from training champion teachers to whole school approaches in 2019. Adopting this strategy from the beginning would have been a more viable approach for sustainability, with teachers able to take ownership and deliver the project without iMlango staff support. One staff member noted the inadequacies of the initial training approach, arguing:

Every year, we train new teachers and make sure they are supported. We realised [training] the focus teachers [alone] is not sustainable. (iMlango staff, KII)

It is noteworthy and commendable how the iMlango focus on teacher training was sustained and increased throughout the programme. Respondents expressed that more training would have been beneficial (3 PS) as it would have enabled more technical and pedagogical knowledge to be present at a school level, and so schools would not be waiting to be assisted. This could have increased the likelihood of schools sustaining iMlango through increasing their own knowledge and removing dependence. One staff member noted the sustainability of gender interventions and their continuation post-project was dependent on the extent of capacity building of teachers, while two project staff members reported the sustainability of the project is dependent on the involvement of the HTs who were instrumental in convincing school staff to adopt the project.

Community engagement

The fifth challenge to sustainability is ensuring sufficient support among parents and communities. As detailed earlier, parental and community support is vital to sustainability as it can increase students' engagement in iMlango activities (4 PS). However, the approach to outreach and garnering this support was identified by multiple interviewees as an area that could have been strengthened, particularly in light of some initial community resistance to the project (4 PS). One staff member noted that increased parental outreach during Covid-19 increased parental support for iMlango. Although another staff member reported the introduction of Agenda advisors in 2019 helped reduce community resistance and was a viable shift in practice. One project staff member articulated that parental support is especially important for girls, particularly support for items such as sanitary pads and underwear, which can make the project and its girls' education benefits more sustainable.

MoE engagement

The sixth identified challenge to sustainability is the need for iMlango to appropriately engage with the MoE. Four project staff members mentioned the MoE needed to be more engaged and the relationship between iMlango and the MoE better managed throughout the project, particularly in its inception. One staff member reported that around 50% of schools still needed more time to engage the MoE to take ownership of project activities to help sustain iMlango in their schools. When discussing the relationship between the project and the senior levels of the MoE, there was a lack of consensus over the extent of engagement between both parties . One staff member reported that senior ministry figures were appropriately engaged by iMlango, although two staff countered that there was a lack of engagement which generated some opposition to the project. In addition, it was reported that the MoE was only fully engaged in 2019 (2 PS). Furthermore, at the beginning of the project the MoE had concerns about whether the iMlango content was aligned with the curriculum (1 PS), although once this was demonstrated the MoE were keen to support the project and wanted to learn from it due to their desire to scale technology in schools (1 PS).

Despite this, it was agreed that the very top level was less engaged in the project (2 PS) and in particular the project approach prior to 2019 could have been improved to increase MoE

engagement and ownership of project activities. The lack of direction and engagement from the top level made it harder to engage teachers in the project (1 PS). Further engagement with the MoE is vital for sustainability for two main reasons. Firstly, the MoE will remain working in schools and so need to support and understand the project to effectively take ownership of project activities and ensure its continuity (1 PS). Secondly, two project staff members reported the lack of appropriate project engagement with the MoE has led to challenges in embracing the project. Because the methods and skills provided by iMlango were not fully endorsed by the MoE, teachers were less motivated to participate in them. If the MoE continues to not recognise iMlango interventions as additional qualifications, the upskilling provided will be viewed as less significant by teachers which represents a barrier to its continuity. Having the top level of the MoE engaged and supportive of iMlango from the beginning of the project therefore offered a more viable approach to sustainability, and will enable the MoE to effectively take ownership of teacher training activities delivered by the project. In addition, having the MoE and TSC with an aligned supportive message on iMlango activities from a top-down level could further support learning and the continuation of iMlango (1 PS).

Consortium approach

A final consideration for the viability of sustaining iMlango activities is the consortium approach. When discussing this approach, there was a mixed response among interviewees. Two project staff members identified working with other partners was a strength. The main reasons cited for this were: the partners supported each other well (2 PS), partners shared information effectively (1 PS), and partners possessed high levels of expertise in their individual areas within iMlango (1 PS). However, four project staff identified the consortium approach as a considerable weakness to the iMlango project overall. Specifically, five project staff members identified the approach led to a lack of clarity and collaboration at the top level of the project. Interviewees reported that there was some lack of clarity in the initial definition of partner roles (3 PS), and that this led to instances where project activities failed to work towards shared and consistent objectives. Having more clearly defined partner roles would have helped to provide a clear plan for delivery and leadership (2 PS).

Four project staff members outlined this lack of clarity and collaboration within the consortium translated to a lack of efficiency on the ground. The lack of synergy led to different partners duplicating project activities (2 PS), in addition to project activities being inefficient and compartmentalised. In particular, two staff members expressed that the structure of the consortium approach had led to areas where partners worked somewhat independently on project activities. This, combined with a lack of clear direction from the top level meant field staff prioritised individual and often conflicting partner goals, rather than shared objectives. This was further compounded by the perception that there was too little field presence from line managers (1 PS) and Avanti staff (2 PS) prior to March 2020, which resulted in a lack of leadership and direction. Having a stronger in-country leadership presence earlier in the project could have improved project coordination and cohesion between partners and their individual activities (3 PS), and reduced the understandable siloing of consortium partner activities.

Additional challenges

In addition to these main themes, other challenges to sustainability were discussed. It was identified that BoMs retaining support for the project is a challenge, having changing BoM members every 5 years threatens sustainability as they could become unsupportive (2 PS). Although some offline learning content was provided, a blended approach of offline and online resources was identified as being the most sustainable as it increases access to learning materials (2 PS). Offline content will be discussed further in chapter 6.4. In addition, although iMlango learning materials will remain in schools, the challenge to sustainability will be their usage (1 PS). Other barriers to sustainability identified in school-level KII interviews were:

- Theft/a lack of school security (3)
- A lack of parental engagement or support for the project (2)
- The transferal of trained staff, hence digital learning loss (1)
- The collapse of the school feeding programme impacting on attendance (1), although this is not an iMlango activity
- A lack of teacher/headteacher engagement in the programme (1)

Conversely, two BoM members stated that they did not perceive there to be any barriers to continuing the programme. One staff member summarised that despite the uncertainty over sustainability, the project has been successful:

> *I believe whether iMlango continues or not, the impact has been made. (iMlango staff, KII).*

6.3 Sustainability of Covid-19 response

This section will examine the potential to sustain elements of the response to the school closures due to Covid-19. The findings will firstly draw on references made in the qualitative data regarding the perceived valuable activities and their potential helpfulness of incorporating aspects of the response into regular programme activities. Then, suggestions for what improvements could have been made to the Covid-19 response will be discussed, before finally exploring whether the Covid-19 response assisted or hindered the continuation of project learning objectives.

Overall Impact

As outlined in Chapter 4.4, iMlango's Covid-19 response was hindered by dependence on accessibility of smartphones (which were not as widely available as had been anticipated), and lack of a clear communication strategy. Only 23% of survey respondents reported having used the iMlango app during school closures. The main reasons were a lack of awareness of the app (36%, 90) and having no access to a smartphone (34%, 66). This was echoed in the KIIs, with one headteacher estimating that only around 40% of parents had smartphones. Furthermore, Chapter 4.4 highlighted the fact that 40% of the interview sample reported receiving no support during the school closures. These findings do suggest that more could have been done to provide support to a wider proportion of the student population. However, it should also be remembered that this was a fast-moving 'emergency response' context with a mandate for the

project to explore ways of helping children to access learning content at home during school closures. This was an inevitably difficult task with many barriers encountered.

Indeed, iMlango was seen by some as a facilitating factor for learning during the Covid-19 school closures. A theme emerged from the KIIs that students and teachers were better prepared for online learning than their counterparts due to the iMlango project. To illustrate this, one MoE official stated that iMlango teachers were better equipped to attend Zoom meetings, whilst three teachers explained that using the computer lab before the pandemic meant that children found it easier to access online learning during school closures. In this way, iMlango was spoken of as having better prepared schools for teaching and learning online (with the caveat that these benefits depended on access to technology at home). This suggests that there is a basis for a more sustainable approach in the future, based on the learning from the last year and the opportunity to be more digitally prepared.

Suggested improvements

Before discussing improvements that could have been made to the Covid-19 response, it is important to acknowledge the complexity of the situation faced by the project, in particular the unprecedented nature of the Covid-19 pandemic. Working in a context of rural and marginalised communities added further difficulty, as means of engagement with students and teachers was particularly hampered by restrictions on movement. However, it remains significant that overall, as discussed in Chapter 4.4, the Covid-19 response fell short on many of its intended objectives. One project staff member summarised the need for changes to be made, stating:

> *We can only talk about what to do next time, rather than really what worked in this environment. (iMlango staff, KII).*

When project staff were asked about what improvements could have been made to the Covid-19 response, three significant improvements were identified. An overarching caveat is that the improvements are staff member suggestions, and there may be reasons why some are not practically feasible. Firstly, three project staff outlined that paper-based resources could have been distributed, in order for content to be accessible for everyone. However, all three staff recognised that this approach would have needed additional support in terms of facilitation and finance to reach some rural communities. As one staff member summarised:

> *Having a budget for this [delivering paper-based resources] would have been an issue, but would have been beneficial. (iMlango staff, KII).*

One staff member articulated that the project had thought about developing and distributing hard learning materials, but decided against this approach as to not break government Covid guidelines. There may have been additional reasons for the lack of distribution of hard learning materials, however these were not detailed in the KIIs. As such, the provision of paper based materials would likely have faced significant barriers, and so it is unclear whether this would have offered a more viable alternative.

Secondly, two project staff articulated improvements that could be made to enhance network connectivity. For example, the project could have worked with internet providers to subsidise

its cost and make it more affordable at home for students (1 PS). One staff member reported that most homes do not have access to good connectivity, and so centralising areas of connectivity around schools could have been useful. Additional suggestions were made to improve access to smartphones, for example the project ensuring each household had access to one smartphone prior to releasing the app (1 PS). Taking measures similar to this would have overcome the major barriers to students accessing the learning content at home, making it more sustainable.

Lastly, it was identified that the project having increased engagement with parents and communities would have been helpful, as it would have allowed for learning materials to be more easily passed to learners (3 PS).

To what extent did the Covid response solidify the benefits of iMlango?

Due to the challenges of the Covid-19 response, there was a consensus that Covid-19 activities failed to solidify the benefits of iMlango, however views were not unanimous. Although one staff member positively reflected that the Covid-19 response engaged BoMs more, allowing them to observe how the project was helping children and so increased their support, the majority of project staff discussed in greater detail the ways in which Covid-19 activities failed to solidify and sustain the benefits of iMlango. As discussed earlier, the most significant reason for this was the overall lack of student engagement with the Covid-19 response. The shortcomings of the Covid-19 response were summarised by one project staff member:

> *If I rated the project in achieving objectives, I'd give it 70%. Because of Covid we couldn't achieve more – we had really clear plans for this year but covid affected that 30%. (iMlango staff, KII).*

Other reasons reported for this lack of achievement during Covid-19 were that: girls' clubs failed to run in any capacity during school closures and so their benefits could not be accessed (1 PS), although good school management positively impacted on the uptake of Covid-19 initiatives the level of management and therefore uptake varied from school to school (1 PS), and a lack of hard materials available in public places for students to more easily access and learn from (1 PS). This consolidates the view that the Covid-19 response was largely unsustainable as it failed to meaningfully continue learning improvements. An additional project staff member noted that the government announcing children would repeat the year was problematic, as it made students and teachers relax in their efforts to learn which engagement with the Covid-19 initiatives. The Covid-19 response was therefore also hindered by external challenges.

6.4 Sustainability plans

This section will examine references made in the qualitative data to processes and activities put in place to sustain the project. Firstly, the plans for sustainability will be outlined, divided into three areas which are financial plans, plans for additional support, and plans for the learning content.

Financial Plans

As discussed in Section 6.2.2, schools will need to secure additional funding to sustain the technological and connectivity aspects of iMlango, in addition to education licences and other cost components of the project. In school-level KIIs, interview participants proposed a number of financial initiatives to ensure project sustainability. Most prevalent of these was the creation of income generating activities (IGAs) - an idea proposed by nine interviewees (5 HTs, 3 BoM members and 1 MoE official) in order to raise funds and sustain certain aspects of the project. The types of IGAs proposed centred mainly on utilising or establishing a school farm (6), but also included the suggestion of purchasing a printer-photocopier (1). Generating IGAs for sustainability was enacted towards the end of the project, where the field team prioritised fundraising initiatives and helped develop IGAs within schools (1 PS).

Aside from developing IGAs, the second most popular suggestion for additional support from school-level KIIs was proposing to engage the local community as means to sustaining iMlango. This was expressed by eight participants (5 HTs, 2 BoMs, 1 teacher). Three headteachers and one teacher made a financial proposal to request small contributions from parents within these communities. Two project staff members expressed that the project had also enacted the financial component of this idea, and that staff had encouraged schools to start speaking to parents and alumni for financial contributions to sustain the project.

Plans for additional support

Project staff detailed two additional support activities that have been put in place by the project to help sustain its outcomes. One staff member reported there is a plan to remain in schools for another year, to ensure schools possess the technical capacity to maintain the provided hardware. Another staff member detailed a change in approach in the final months of the project for ICT maintenance. Schools worked collaboratively so they can be supported remotely, and get an understanding of the process required to fix technical equipment. This approach aimed to build the technical maintenance capacity of staff within iMlango schools.

Learning content

A key approach to sustain the project is ensuring the learning content will continue to be available to schools. Three project staff members articulated a shift in teacher training from 2019 that aimed to help teachers understand the purpose of iMlango and the learning content, to help fully integrate the software into literacy and maths teaching without the presence of project staff. Additionally, an online teacher training platform targeted at maths teachers to develop ICT pedagogies and collaborative learning ran between February 2020 and March 2021, which was explicitly designed for teachers to deliver maths learning through ICT practices within the classroom (1 PS). These training initiatives aimed to ensure the learning content will continue to be integrated into school lessons.

One aspect of the iMlango project which has been proposed as a tool for sustainability - and to mitigate against the connectivity challenges outlined above - is the utilisation of offline learning content. Four project staff members recognised that Maths-Whizz content is now available offline, and an additional two staff reported all learning content is now available

offline within computer labs. These measures aimed to ensure content could be accessed even without internet connectivity. Project staff offered additional reasons for why they feel Maths-Whizz content in particular will be sustained. These were that: the content is of outstanding quality (3 PS), the content is relevant to students (3 PS) such as developing a Kiswahili version of Maths-Whizz to allow young children to access content in their native language, and Maths-Whizz content being well aligned with the curriculum and so will remain useful for learning (1 PS).

6.4.1 Feasibility and appropriateness of sustainability plans

The following section will examine the feasibility and appropriateness of the sustainability plans outlined in the section above. Using qualitative data, the section will address the appropriateness of the solutions for each of the three areas outlined in the above section, namely financial plans, plans for additional support, and plans for the learning content. It is important to note the closure of the project and therefore the sustainability plans were significantly hampered by the Covid-19 pandemic, subsequent school closures and the need to pivot to remote learning.

Financial plans

When discussing the approach to secure external funding through parents and communities, one project staff member was sceptical. They argued due to the pandemic many parents have lost income sources and so it will be difficult to secure extra funding from within communities. The resources that will need to come from communities to sustain iMlango do not exist in the current economic climate, and so securing external funding will be a challenge for most schools. However, one staff member reported a small opportunity for funding, expressing that parents who profited from the microfinance initiative could have funds available to contribute to sustaining iMlango. It also remains unclear the extent to which IGAs will be able to cover the costs of project components, even if they are developed in schools.

Plans for additional support

The project plans for additional support were outlined earlier, and the objective of providing continued support was supported by school-level interviews: seven participants specifically requested that the project continue. Despite respondents demonstrating a strong level of support for the project, some suggested that their schools did not feel prepared for the project to end. Indeed two (1 HT, 1 MoE) requested that it continue for another year, in order that schools could better prepare.

This concern about a lack of preparation was mirrored in project staff interviews. One staff member raised concern that more time was needed to allow schools and communities to develop sustainability plans. Another staff member reported they overheard a letter of information detailing what is needed to sustain the project will be distributed to schools, although at the time of interview this was not confirmed, the letter has now been sent. Additionally, the thoughts of a third staff member who articulated they were unsure about what plans had been put in place at a consortium level to sustain the project. These views

illustrate a lack of clarity or well planned approach for project closure. This finding is consistent with the findings of the midline evaluation, where a wide range of levels of preparedness for project sustainability and knowledge of project closure within schools was reported. It is also important to note that the challenges of school closures over the last year have made it even harder than anticipated to implement plans to prepare for sustainability.

This concern for a well-planned project closure is well-founded when considering the school-level interviews. One BoM member stated that their school had been making preparations for when the project ended. However, two interviewees stated that their plans had been derailed by Covid-19, a further three stated that they had held some meetings but had no fixed plans yet, and another two reported that they had not conducted any meetings about sustaining the project. Finally, three participants displayed a lack of awareness about the future of the project, either stating that they needed more direction, that they knew little about the costs of the project or that they were unaware that it was coming to an end.

The opportunity to ask questions at the end of each interview revealed a divide amongst participants who were aware that the project was ending as opposed to those who were unaware. Among the three who were aware of project closure, one BoM member asked whether there were any other partners with which his school could continue the project, one MoE official asked why it was ending, and one teacher asked what will happen once it has ended. Conversely, six participants further displayed a lack of knowledge that iMlango was concluding. Specifically, four respondents asked if the endline interview meant that the project was ending (2 teachers, 1 BoM, 1 MoE). Another teacher similarly asked whether it would continue, and a BoM member asked what the project's future plans were. This split indicates that not all schools have been warned or have clearly communicated to all staff that the project is concluding.

Learning Content

The creation of an offline content option was reported to be a significant step in increasing the accessibility of the programme. This is a sensible addition, and can be implemented without detracting from the core programme offering of online content. Although this was identified as increasing access to learning materials (2 PS), it also inevitably removes a key component of the programme which is the benefits associated with access to live data and real-time personalised learning. An appropriate route forward for sustainable usage was considered to be the use of a blended approach of both online and offline learning (2 PS), which would allow students greater access to all of the benefits provided by the Maths-Whizz and literacy content.

Additionally, when teachers were asked about their familiarity with offline animated maths content and its potential to support whole-class lesson delivery after the project's end there was a mixed response. The majority stated that they had used it and found it effective (8 of 15 responses). Among them, the teachers provided a number of reasons for its effectiveness (compared to the online content):

- It is accessible when the internet is not working (1)
- It is more detailed than the online content (1)

- It is faster to access/log in to (1)
- Unregistered students are able to use it too (1)
- Teachers can transfer the content from the laptop to a USB, for students to access it at a cyber café (1)

However, there were also two relative disadvantages discussed. One teacher mentioned that they couldn't edit it (compared to the online content), while another teacher said that it required some updates. Otherwise, the benefits or challenges mentioned by teachers were the same as those of the online content.

Five teachers, on the other hand, did not express any awareness of the offline content (of these, three were maths teachers). Of the remaining two respondents, one (a maths teacher) had experienced trouble accessing the content, and the other (not a maths teacher) knew of it, but understandably had not used it.

6.5 Conclusion

This section assesses the project's ToC to determine the extent to which iMlango activities are able to sustain learning improvements. In addition to the thirteen original project activities outlined within the ToC, other significant project activities are also included within this chapter. All of these are assessed with regards to their contribution to the five intended outputs. The findings of this chapter suggest that, of these, only one output is widely perceived as being sustainable, and although opportunities for sustainability exist within the other four outputs, its extent is varied and significant barriers exist.

Girls' clubs were overwhelmingly found to be a sustainable project activity, and its significant contributions to improved girl engagement in girls clubs (output 4) will be continued. The findings in particular illustrate that project activities not referenced in the ToC, most notably the low cost of girls' clubs and having locally available mentors, will sustain self-esteem and confidence improvements within girls. This will allow the improved learning outcomes for girls outlined in Chapter 4.2 to continue to be delivered through these clubs.

The findings demonstrate that teacher training and in-field support project activities have contributed to sustainable improvements in teacher skills, knowledge and attitude (output 1). These activities have helped overcome resistance to iMlango methodologies, and these improved skills have already been passed to teachers, meaning the incorporation of the learning content into lessons will be continued post project. However, the findings also evidence significant barriers to these skills and knowledge continuing in schools. Teacher transfer away from iMlango school removes this knowledge, although this barrier is external to project activities. Additionally, the training approach of using focal-point teachers, combined with an overall perception of a lack of training, limited the extent to which project activities managed to embed these knowledge and skills at a school level. The design of project training activities therefore contributed to both enhancing and hindering the extent that improved teaching skills, and their beneficial impacts on learning outcomes, will be continued.

Similarly, project activities resulted in mixed outcomes for sustaining the improved individual engagement with iMlango resources by girls in primary schools (output 2). Although

interviewees agreed upon the learning improvements facilitated by access to hardware outlined in Chapter 4.2, these outcomes will only be sustained if the hardware remains accessible. The findings demonstrate schools will struggle to maintain hardware after project technical and financial support is removed, and the dependence on these elements has hindered sustainability. Access to connectivity and online content will also be difficult to sustain, as schools will struggle to afford the cost of providing internet access, an issue compounded by the lack of connectivity in areas where most students live. Additionally, a reported lack of computers per school further reduces student engagement with the learning content, which is compounded by external challenges such as the price of electricity and power cuts. It is significant that while project activities contributed to improved engagement with hardware, the removal of these activities will result in a significant number of schools being unable to sustain the access to hardware and the associated learning improvements.

There is no evidence determining if reducing financial barriers to education through the delivery of microloans (output 3) has impacted on sustainability and so it cannot be assessed. A caveat is that when considering financial barriers at a school level, rather than a student level, significant barriers to sustainability emerge. Due to the high cost components of connectivity and technology maintenance, it is essential that schools have IGAs in place to help sustain the project. However, only 40% of schools currently have such activities to finance project continuation, meaning these elements and the learning improvements they deliver are unlikely to be sustained in the majority of schools.

The final output contributing to sustainability in the ToC is the improvement in key stakeholder engagement to enable sustainability of girls' progression through education (output 5). The project approach to MoE and community engagement prior to 2019 was widely viewed as poor because it failed to tackle resistance among these groups. Whilst it was recognised the shift in approach after this date helped overcome resistance, the top-level of the MoE remained less engaged and some community resistance remained. It is clear that more focus was needed on this output to deliver sustainability.

This approach also had significant implications for the assumption that county-level officials and schools take initiative in the ownership of the project. Having limited MoE engagement at the very top level has reduced the extent to which the MoE has assumed ownership of project activities and teaching. Significantly, it was reported that around only 50% of schools needed more time to engage the MoE to take ownership of project activities to help sustain iMlango, demonstrating the assumption is not well founded. Similarly, there are many aspects of the project that schools cannot take ownership of, due to the high costs and advanced technical knowledge required. This demonstrates this assumption, which is key for project continuation, was not delivered through project activities.

This chapter also presents significant findings on the impact of activities not included in the ToC on sustainability. The consortium approach adopted was reported by some as leading to inefficiencies and competition between partners which meant activities were not delivered as effectively as they could have been. Others disputed this idea and reported that there had not been competition. The findings demonstrate that while significant improvements needed to be made to Covid-19 response activities to continue to provide the learning outcomes reported in Chapter 4.2, project activities were to some extent restricted by external factors. It was

suggested that providing paper-based materials or ensuring students had enhanced access to connectivity and smartphones could have improved the impact of activities. However, it was recognised the success of these alternative approaches would have been dependent on external factors, such as government Covid-19 restrictions and securing extra financing. Similarly, the Covid-19 response was viewed as largely failing to solidify the benefits of iMlango due to a lack of student engagement, although the government announcing that the school year would be repeated was an additional external challenge that lowered engagement with the Covid-19 initiatives.

Certain project activities and an apparent lack of plans for sustainability further reduced the likelihood of the continuation of learning improvements. The project encouraging schools to develop IGAs and contact local communities for financial contributions is unlikely to be viable at scale because of the level of poverty and associated lack of disposable finances within local communities surrounding the iMlango schools. Most interview respondents also indicated a lack of clarity of any sustainability plans, and the variety of responses demonstrates a poorly coordinated approach to project closure. Although introducing offline content was identified as a suitable initiative to allow schools to continue to access the learning content, this removes access to key components such as personalised learning, and staff members identified a blended approach would be most suitable for continuing the full learning benefits delivered by iMlango.

Overall, the evidence demonstrates that while some project activities have contributed to sustaining learning outcomes, other project activities have hindered this process in their design and delivery. Most importantly, the removal of certain project activities that have enabled improvements in learning outcomes throughout the project threatens sustainability, as schools and county-level governance systems are not yet in a suitable position to take ownership of these activities. It is important to recognise that the self-reported nature of this evaluation's findings, in addition to the speculative nature of addressing sustainability, cannot provide conclusive evidence of what activities can be sustained. However, there are clear indications iMlango activities have a way to go to guarantee sustained learning outcomes after project conclusion. It is also important to recognise that numerous external factors outside of project activities have also contributed to a lack of certainty around sustainability.

Chapter 7: Analysis - Value for Money

7.1 Introduction and context

This section presents findings related to the VfM offered by the iMlango approach, by discussing the history of VfM in iMlango (7.2), an individual assessment of the VfM offered by project components (7.3), and the future opportunities for VfM post-project (7.4). At the chapter's conclusion (7.5), the main findings are summarised and discussed.

Findings in this section relate to the following research questions:

Table 17: Research questions related to project value for money

RQ #	Research question
Research theme 3: Project sustainability, VfM and scalability	
3.2	**Value for Money:** To what extent does iMlango provide good Value for Money? Did the processes of achieving results justify the costs incurred?

7.2 History of VfM in iMlango

It is important to note at the outset of this section that the iMlango project is unlike other GEC projects. It was designed in an innovative way with the backing of FCDO (then DFID) to explore private partnerships in introducing technology into school based learning, and to explore how this could gradually transition to a less donor-dependent funding model. It was understood at inception that this was a well thought-through, yet experimental approach, and one that required a significant budget given the scope of the project.

This section outlines the bigger picture of VfM throughout the implementation of iMlango. It discusses the extent to which schools have been able to take ownership of iMlango activities, which would greatly enhance sustainability and therefore the VfM offered by activities.

A challenge to sustaining iMlango identified in Chapter 6 is that schools depend heavily on certain activities provided by the project, most notably maintenance support and connectivity. Two project staff members reported the dependency attitude of some schools further threatens sustainability as these schools do not proactively engage in sustaining elements themselves. Similarly, one staff member reported that the mentality of iMlango being a donation makes it harder to sustain. Schools being dependent on high cost elements of the project, in particular connectivity, educational FOs and technical maintenance, results in high expenditure on project components that are unlikely to be maintained.

In light of this context the evaluation considers VfM in a manner aligned with the FM guidance, recognising that using a narrative approach combined with available quantifiable budget and beneficiary data can produce useful VfM considerations. The evaluation merges the conventional 4 E framework with the DAC criteria to assess the following categories:

- Efficiency and VfM
- Effectiveness and equity and VfM
- Relevance and VfM
- Sustainability and VfM

These four metrics act as strong indicators as to whether iMlango offered VfM. The following chapter does not repeat what has been said before on each, for example Chapter 6 is focused on sustainability, but instead provides a brief overview and analysis on the VfM-specific aspects of each metric.

7.3 Breakdown of VfM by project component

This section uses qualitative data to outline perceptions of whether project components offered VfM. This analysis will provide detail on the effectiveness and equity of project components and their VfM, through considering which project components particularly offered VfM and drove value. Firstly, whole project costs are outlined in addition to the limitations of this approach. Then, the cost per school and cost per child figures for the whole project are presented. This is followed by a brief narrative assessment of VfM. Lastly, staff and stakeholder perspectives on the VfM of project components are presented.

7.3.1 Breakdown of whole project costs and limitations

Project costs per component and per year

The table below provides a breakdown of the cost of each component of iMlango. It provides the cost per year and also the total iMlango cost of £32,027,274.

Table 18: Total costs of selected project components (actual cost (quarters 1-14) and projected costs (quarters 15-16))

Project Component	Cost				
	April 2017 - March 2018 (Q1-4 Actual)	April 2018 - March 2019 (Q5-8 Actual)	April 2019 - March 2020 (Q9-12 Actual)	April 2020 - March 2021 (Q13-14 Actuals, 15-16 Projected)	Total

Attendance Monitoring	£487,666	£430,545	£423,758	£317,037	**£1,659,006**
Education Licences	£2,161,488	£1,938,419	£1,690,123	£1,131,341	**£6,921,371**
Field Staff	£1,639,353	£1,847,731	£1,994,877	£1,679,567	**£7,161,528**
Girls' Clubs	£0	£123,520	£246,372	£85,777	**£455,669**
ICT Maintenance	£557,972	£540,563	£618,478	£164,340	**£1,881,353**
Internet Provision and Maintenance	£1,174,298	£1,252,512	£1,191,195	£1,235,878	**£4,853,883**
Microfinance	£126,267	£194,936	£423,036	£218,220	**£962,459**
Teacher Training	£47,045	£232,574	£74,146	£55,459	**£409,224**
Whole Project Costs					
Total Costs	£8,115,381	£8,688,803	£8,761,875	£6,668,662	**£32,234,722**
Budget and Cost Difference, with Q16 sQuid Income Repayments	£524	-£4	-£1	£206,928	**£207,448**
Final Budgeted Costs	£8,114,857	£8,688,807	£8,761,876	£6,461,734	**£32,027,274**

Explanation for approach to calculations

The project component costs listed above are calculated from the GEC2 budget from January 2021, which lists the actual project costs between the first and fourteenth quarter plus the projected costs from quarters fifteen and sixteen. Total project costs were further corroborated with the GEC-T budget revision from January 2021. The project components selected for inclusion were done so to provide weight and reference to discussions on VfM and sustainability that emerged from the data, where the cost of the selected project components was central to the findings. A breakdown of how each component was calculated is detailed below.

- **Attendance monitoring** includes all expenses listed under the activity 'Provision of attendance monitoring system in primary schools'.
- **Girls' clubs** includes all project expenses where the subcontractor is listed as 'DLA' (NB. 'DLA' has been renamed 'Impact(ED)' but this is not reflected in the budgets).
- **Education licences** includes all project expenses delivered by sQuid and Whizz that contain 'licence', 'lisence', or 'license', and that were not included under other activities. This approach was taken due to a lack of activity or other organising factor to group education licences. A limitation is that this might have missed minor relevant expenses,

or included minor irrelevant expenses, and so while not completely accurate the total is nonetheless indicative of the level of expense incurred by education licences.

- **Field staff** includes all non-training project expenses where the activity is listed as 'in-field support'. It is important to note this does not include expenses related to UK based and more senior staff, and includes costs that facilitate the use of staff such as transport and accomodation. From the budgets it was not possible to discern which tasks staff were allocated to, and it is important to recognise this will slightly lower the actual costs of other components that required expenditure on staff.
- **ICT maintenance** includes all project expenses where the activity is listed as 'ICT infrastructure maintenance'.
- **Internet provision and maintenance** includes all project expenses where the activity is listed as either 'Provision of satellite connectivity for schools and maintenance' or 'Provision of satellite capacity for CIHs and maintenance'.
- **Microfinance** includes all project expenses where the activity is listed as 'Provision of stipend and MFI loans'.
- **Teacher training** includes all project expenses where the activity is listed as 'teacher refresher training' and 'training for secondary schools'. Note that training for child clubs is included under girls' club expenses. Training related expenses listed under the 'in-field support' activity are also included here.

There are various limitations with this approach. Firstly, the detailed expenses could not always be easily grouped into the listed project components. It was therefore not always clear what category or component that individual expenses belonged to. The manual process required to group expenses into components may have resulted in slight inaccuracies with final figures, although the provided costs are representative of the level of expenditure on each component. Secondly, corroborating total project costs across two budgets was not straightforward to do accurately. It was not possible to determine the reasons for the difference in total project costs and budgeted costs in the first three years. Thirdly, girls' clubs costs were calculated using school numbers and school beneficiaries, rather than the number of girls' clubs and girls' clubs beneficiaries. This will slightly lower the cost per beneficiary as not all beneficiaries would have been able to access the girls' clubs. Lastly, project costs could only be viewed as a whole, and any disaggregations in cost between types of school (A, B, C) or level of school (primary, secondary) were not possible. This is a significant limitation that prevents more granular analysis based on type of intervention.

7.3.2 Cost per school and cost per child and limitations

Project costs per school and beneficiary

The table below provides a breakdown of costs per school per year, and of direct and indirect beneficiaries.

Table 19: Project components total cost per beneficiary and cost per school per year

Project Component	Total Cost	Cost per school per year	Total cost per direct beneficiary (girls)	Total cost per direct beneficiary (girls) + learner beneficiaries (boys)
Attendance Monitoring	£1,659,006	£1,693	£16.73	£8.56
Education Licences	£6,921,371	£7,063	£69.78	£35.71
Field Staff	£7,161,528	£7,308	£72.20	£36.94
Girls' Clubs	£455,669	£465	£4.59	£2.35
ICT Maintenance	£1,881,353	£1,920	£18.97	£9.71
Internet Provision and Maintenance	£4,853,883	£4,953	£48.94	£25.04
Microfinance	£962,459	£982	£9.70	£4.97
Teacher Training	£409,224	£418	£4.13	£2.11
Whole Project	£32,027,274	£32,681	£322.89	£165.22

Table 20: Yearly project beneficiary figures and project cost per child per year

Beneficiary Figures				
Beneficiary	2018	2019	2020	2021
Direct Beneficiaries (Girls)	63006	60466	77698	77698
Learner Beneficiaries (Boys)	62249	58481	73188	73188
Total Beneficiaries	125255	118947	150886	150886
Total project costs per child per year				
Girls	£128.79	£143.70	£112.77	£83.16

Total	£64.79		£73.05		£58.07		£42.83	

Project component costs per child per year								
Project Component	April 2017 - March 2018		April 2018 - March 2019		April 2019 - March 2020		April 2020 - March 2021	
	Girls	Total	Girls	Total	Girls	Total	Girls	Total
Attendance Monitoring	£7.74	£3.89	£7.12	£3.62	£5.45	£2.81	£4.08	£2.10
Education Licences	£34.31	£17.26	£32.06	£16.30	£21.75	£11.20	£14.56	£7.50
Field Staff	£26.02	£13.09	£30.56	£15.53	£25.67	£13.22	£21.62	£11.13
Girls' Clubs	£0.00	£0.00	£2.04	£1.04	£3.17	£1.63	£1.10	£0.57
ICT Maintenance	£8.86	£4.45	£8.94	£4.54	£7.96	£4.10	£2.12	£1.09
Internet Provision and Maintenance	£18.64	£9.38	£20.71	£10.53	£15.33	£7.89	£15.91	£8.19
Microfinance	£2.00	£1.01	£3.22	£1.64	£5.44	£2.80	£2.81	£1.45
Teacher Training	£0.75	£0.38	£3.85	£1.96	£0.95	£0.49	£0.71	£0.37

Explanation for approach to calculations

There are various limitations to the approach taken. Firstly, *Table 19* outlines the cost per school per year which includes both primary and secondary schools. Because of the lack of disaggregated budget data available from iMlango it was only possible to conduct a cost assessment of the whole project and not break down the costs by type of school (A, B or C), or by primary or secondary. *Table 19* calculates the total project cost per child using the total beneficiary numbers provided in Annex 8.

In *Table 20* the yearly cost per child figures are based on unique annual attendance data plus students registered but not included in attendance. A strong caveat to these figures is that the evaluation team was unable to verify the exact approach and methodology taken to reach these figures. Therefore, while these figures have been included for the purposes of VfM analysis, it is critical to note that it was not possible to determine the reliability and accuracy of the provided figures. As such, any findings or analysis using these figures is not presented with confidence. Similarly, it should be highlighted that the failure to attach dates to student unique registration IDs, resulting in an inability to collect the number of unique registered beneficiaries per year, is a significant oversight by the project which makes the figures hard to

verify and so reduces the accuracy of VfM calculations. Another limitation is that the dates provided for each year of beneficiaries and project costs do not completely align, with the beneficiary figures using academic years (January - November) and the project costs using project years (April - March). This means that calculating the cost per child per year will not be a totally accurate representation of expenditure. However, this approach allows for developing a basic cost per child per year estimate more accurately than taking annual averages across the whole project.

These factors mean that the VfM analysis is only a rudimentary judgement indicative of costs both per child and across a whole project scale. However, its purpose is to present figures to the FM and consortium partners to help catalyse and add value to their relevant internal discussions on VfM and sustainability. In particular, the tables illustrate the immediate financial challenge of sustaining finance at a school level.

7.3.3 Narrative assessment of VfM

The narrative VfM assessment draws out the key information that is presented in *Tables 18-20*. The figures demonstrate that only including girls in VfM calculations is problematic and considerably drives up the cost per child figures. This high cost is unrepresentative, because boys had equal access to the expenditure on almost all project components (except girls' clubs), and so they could be incorporated when determining the real cost per beneficiary. What clearly emerges from *Table 19* however, is that the total cost per school and cost per child figures across the whole project are too high to be sustained. Asking schools to take on a project costing on average £32,681 each year will be highly problematic for most schools without securing substantial external funding.

Tables 19 and 20 also demonstrate that the total cost per child figures are high. It is important to note that large discrepancies can be seen. *Table 20* details a much higher cost per child using attendance and registration figures when totalled (£238.74 per beneficiary across the 4 years) compared to the mean cost per child (£165.22 per beneficiary across the 4 years) detailed in *Table 19*. As mentioned earlier, this difference serves to illustrate the inaccuracies of both approaches. However, using the attendance data in *Table 20* allows for examination of VfM on an annual basis through comparing both annual attendance and registration data and project costs, a critical component adding depth to the analysis that would be missed by using the total figures detailed in *Table 19*.

When considering the yearly cost per child figures in *Table 20* it is important to recognise the impact of Covid-19 in the 4th year of the project. Although project components generally had a lower cost per child in this year, it is important to remember this is duplicated expenditure as a result of the Kenyan governments' decision to repeat the school year. However, it would not be fair to relate these duplicated costs as representing poor VfM, given the significant and unprecedented impact of Covid-19.

There are several key project components that it is important to be aware of. *Table 20* highlights that providing and maintaining the education licences, connectivity, technology, and the human resources required for the facilitation of online learning in rural Kenya is an expensive endeavour. In particular, education licences, field staff, and internet provision and

maintenance are delivered at a costly rate. This has significant implications for the sustainability and scalability of iMlango, especially given these aspects are unique selling points of the project. What is also significant is that all of these components were being delivered at a lower cost per child in the third year of the project compared to its outset. This demonstrates that some progress was made in facilitating online learning in rural Kenya at a cheaper rate prior to Covid-19, but even in the third year of the project the cost per child for these components remained too costly to be sustained and so offered comparatively poor VfM.

Positively, two project components (attendance monitoring and education licences) consistently demonstrated a lower cost per child each year, and so offered improved VfM with project progression despite their high initial costs. Significantly this was not an overall trend, and it is important to note a lack of clear narrative or consistent changes in cost per child and VfM with project progression.

The cheapest components of the project were girls' clubs and teacher training, and the value of these activities has been discussed in Section 6.2. This is particularly noteworthy considering how positively they were reviewed by interviewees, and it can be said that they constitute good VfM. However, these aspects are not unique to iMlango and have been incorporated in other GEC initiatives. It is important to contemplate that the unique components of iMlango relating to its provision of EdTech were considerably more expensive, making them harder to sustain and so comparatively offered worse VfM.

Although it is hard to draw conclusions about VfM it is clear that the cost model of the project is unsustainable and needs to be significantly reworked. The continuity of iMlango is only viable with significant reductions in the cost per child metric. There is an understanding that Avanti and Whizz anticipate a new model for iMlango of under £10 per child per year, and reducing costs to this level presents a radically different proposition in terms of VfM.

7.3.4 Staff and stakeholder perspectives on VfM

There was a lack of consensus among project staff as to whether the iMlango project represented good VfM. Three staff members were uncertain about the VfM of the project as a whole. Two staff members reported iMlango represented good VfM, whilst another staff member felt that the project was inefficient in its use of budget:

> *[...] we could have done better with the costs given the total amount of money we had available. The project was not very efficient with money right from the beginning. If we changed the approach in how we were doing certain things we would have achieved much better VfM. (iMlango staff, KII)*

In project level KIIs, staff were asked to provide retrospective assessments over VfM. Given the role of staff within the project, VfM discussions were mostly framed in terms of project components. Overall, there was a general consensus that the non-cost components of the project are most likely to be sustained, and so offered the best VfM (2 PS). Among these non-cost components, the most commonly cited component as representing VfM was the girls' clubs (2 PS), because it boosted girls' self-confidence enabling them to speak out on important issues to mentors and teachers, which one staff member specifically noted is unusual in Kenya. Two project staff members further identified maths teaching as a non-cost component that

represented good VfM, although no clear explanation for this view was offered. An additional component viewed as VfM was the overall project focus on gender interventions (1 PS). This project staff member reported that they have noticed changing perceptions of gender roles amongst parents and communities who now place greater value on girls' education, and viewed this impact as delivering VfM.

The stakeholder disagreement over whether the project as a whole represented VfM was further reflected within several individual components of the project, namely for the learning content, human resources, and technology components.

Learning content

Firstly, three project staff identified that the learning content overall represented good VfM. In particular, one staff member detailed that taking the content to rural and marginalised communities justified the expenditure. However, there was a distinction made between the literacy and numeracy components. Two project staff identified Maths-Whizz content as representing VfM due to the successful impact of its content on learning. One staff member argued the time and resources spent on product development, quality assurance, and similar processes in the design and implementation phases were justified, as they enabled the subsequent delivery of successful learning impacts. Comparatively, one staff member expressed the literacy component did not represent VfM as it lacked sufficient relevant content. They reported that its implementation was problematic, and there were complaints about a lack of follow-up activities after stories ended. It should be noted that these are simply individual accounts that do not necessarily represent wider experiences. Because of the lack of learning assessment data from the evaluations it has not been possible to do an actual comparative VfM analysis of the different types of learning content and their relative effectiveness.

Human resources

Secondly, three staff members positively reflected that Field Officers offered VfM. The reasons cited for this were that: Field Officers could support the project well (1 PS), their high number could give schools the attention they needed (1 PS), and their extent of training and capacity building ensured learning improvements in schools (1 PS). In contrast, three staff members articulated the use of Field Officers did not deliver VfM. Over the course of iMlango, £7,161,528 (taken from budget actuals) was spent on the field team. There is inevitably a range of perspectives within the consortium as to whether or not this was an overly expensive element. However, it is likely that it could have been delivered with greater efficiency and lower cost. Firstly, one project staff member reported that given the money spent on human resources there were not enough Field Officers, and that their training was insufficient. Secondly, as discussed earlier, the consortium approach led to partners working independently on separate project activities (2 PS). One staff member outlined how this led to inefficient use of resources. For example, staff from different partners would enter a school and complete their separate tasks, instead of coordinating and having a single staff member complete all tasks within a school. The staff member further articulated this lack of clarity and synergy led to human resources being more expensive than necessary, and there could have been significant savings if there was a clear and synergised approach outlined at the beginning of the

project. Lastly, one staff member reported the provision of technical assistance by project staff could have adopted a more remote approach. Conducting support over the phone and only travelling into schools when necessary would have saved significant costs, and so this approach would have offered improved VfM.

Engagement with governance systems

Thirdly, one staff member expressed that BoMs and HTs were only approached in January 2019 to see what areas of iMlango they could engage in. Before this, project staff were required to travel into schools to sort out simple problems that school staff could have fixed themselves, which was an inefficient use of resources. The change of training approach in 2019 to rectify this issue therefore offered improved VfM compared to the initial phase of the project. Lastly, one staff member expressed that not having technicians always locally available to schools was inefficient. This approach greatly increased travel costs in addition to staff hours and associated rates. One staff member similarly argued that engaging with existing infrastructure, such as curriculum instructional officers, would have saved money by removing the requirement for Field Officers to travel to schools and counties. This demonstrates the money spent on human resources could have been used with significantly greater efficiency if Field Officers were more embedded in local educational infrastructures and locations. It should be noted that many of these challenges were exacerbated by the wide geographical spread of iMlango schools. The location of participating schools was taken at the outset of the programme and, it appears, was not a decision taken by the iMlango team. In hindsight it is clear that there would have been significant cost savings and logistical benefits from selecting less dispersed and more geographically concentrated schools to participate in iMlango.

Provision of hardware

Fourthly, four project staff reported that technology provided by the project represented VfM. The identified aspects that they considered offered good VfM included the equipment provided in computer labs (2 PS) and the broadband (1 PS). Two project staff acknowledged that despite the high cost of these technological components they represented VfM. The reason given for this being that the provided computers could teach up to 500 students and the impact on learning at this scale has no alternative (2 PS). Although expensive, the improvement in learning outcomes and engagement discussed earlier meant that VfM was achieved (1 PS). This is because the technology helped create a sustainable improvement in education outcomes at a scale that would be difficult to achieve otherwise.

Alternatively three project staff members referenced that these technological components could have delivered more VfM. One staff member expressed that broadband provision could have been expanded to provide access for more students within schools, in order for learning content to have more engagement. Two staff members reported using new hardware instead of second-hand equipment would have reduced overall costs by reducing maintenance fees, despite the initial higher price of hardware. One staff member estimated this approach could have saved 20% of equipment and maintenance costs. In particular, the use of second hand equipment was seen as poor VfM because it is harder to sustain. One staff member argued that:

> *Quite a lot was spent on maintenance, and I'm not sure it was justifiable, especially now when you are exiting the project and talking about sustainability to the schools, but leaving them with nothing that works - you are expecting the schools to start fresh with hardware. (iMlango staff, KII).*

Using second hand equipment makes the equipment harder for schools to sustain, due to the need for greater finances and technical knowledge to conduct repairs at a school level. The experience of iMlango with use of second hand hardware reflects a broader trend in the EdTech sector. When iMlango was established it was more normal for donor funded programmes to utilise second hand hardware in order to reduce initial outlay costs. Over the last few years, as new unit costs have reduced and have become more reliable, the economic case for second hand hardware has become less compelling. It is clear that if iMlango were to procure hardware again there would now be more cost-effective approaches available than the one taken.

Other components

There were four other project components that were explicitly defined as not offering VfM by project staff. Note that these are not necessarily representative views but were identified as significant factors by individual interviewees. It was reported that the attendance monitoring component use of hard copies in addition to electronic data increased both the cost and workload for teachers (2 PS). The microfinance component was also noted because of concerns about the potential impact on children plus uncertainty regarding its position within the broader context of iMlango (1PS). Thirdly, it was reported that money was needed to cover necessary expenses for facilitation and reimbursement of MoE officials and stakeholders, but the project sometimes lacked budget for this facilitation (1 PS). Finally, the on-going challenges of teacher transfer away from iMlango schools also led to significant unanticipated expenditure as it meant teacher training had to be restarted at multiple points (1 PS).

7.4 Future of VfM

This section outlines the opportunities and challenges for VfM to be achieved in the future. These issues are considered in alignment with FM guidance, by firstly contrasting the efficiency of the previous consortium approach to the opportunities offered by the streamlined approach. Secondly, the future effectiveness of the project is outlined to build on discussions in Chapter 7.3. Thirdly, the project relevance in terms of optimal allocation of resources is discussed and future opportunities considered. Lastly, important sustainability conclusions from a VfM perspective are detailed.

Efficiency

Evaluating project efficiency requires determining how smoothly project interventions were delivered, in addition to considering what could be done to improve future efficiency. As discussed in Chapter 6, the previous iMlango consortium approach was identified as having significant inefficiencies. Having a streamlined consortium approach is vital for VfM moving forward. In particular, hiring resources as a consortium rather than through individual partners

in addition to identifying areas of synergy where partners can collaborate could lead to significant savings (2 PS).

Having too many partners who lacked central coordination appears to have fostered an environment of competition in parts of the consortium. For example, literacy and numeracy learning was delivered through the same computer labs, and one project staff member articulated that children preferred the numeracy content, however, the partners responsible for the literacy component were unhappy with the labs being used more for numeracy (1 PS). It should be noted that another senior staff member contested this and said that there had not been any challenges. It would appear that fewer partners with more clearly defined roles and accountability structures would provide an operating context more likely to provide good VfM in the future.

Effectiveness and equity

The effectiveness of the project considers whether it offered good VfM overall, and in particular which components drove its value. This is discussed in detail in Chapter 7.3, but when considering the possibilities of future effectiveness, significantly, delivering future VfM through a low cost-per-child future is dependent on three core factors. Firstly, a lower cost-per-child can be delivered through achieving scalability, the opportunities of which will be discussed in Chapter 8. Secondly, achieving the full accelerated learning benefits is dependent on having access to online aspects of learning content, in particular personalised learning and real time data. The suitability and challenges of achieving this have been outlined in Chapter 6.4. Finally, achieving full accelerated learning is dependent on students having the recommended engagement with the Maths-Whizz tutor. Chapter 5.2 and 6.2 have discussed the barriers to student engagement with the provided hardware and learning content. It is essential these barriers are removed if the future approach is to achieve VfM in delivering full accelerated learning at a low cost-per-child rate.

Relevance

Project relevance considers whether project resources were allocated optimally to both programme participants and achieving programme objectives. It also merits an assessment of the project design, and changes in practice during the project that aimed to optimise resource allocation. Given the purpose of the intervention, a significant proportion of resources was expended on EdTech and connectivity components. While this was appropriate given the project objectives, it is clear that there were also fund wastages within these components, due to the inefficiencies outlined in Chapter 7.3. Although project expenditure would necessarily have remained high on these components, the allocation of funds could have been significantly optimised. Overcoming the previously detailed inefficiencies is essential if the project is to offer optimal resource allocation in the future.

While the resources allocated had a demonstrable impact on beneficiaries as outlined in Chapter 4, the crude cost per child per year ranging between £42.83 and £73.05 indicates high expenditure on each programme participant to achieve these improvements. It is therefore necessary that moving forward the project delivers on the opportunity of enhanced programme effectiveness detailed in the subsection above. This will deliver learning

improvements at a much lower cost per child, which would represent a more optimal allocation of resources.

Significantly, there were many changes to project design throughout its duration. In particular, approaches to teacher training and community outreach, in addition to introducing a gender specialist and additional senior staff to the field were major changes during the project. The findings have demonstrated these changes were mostly viewed positively, indicating that while initial project design was not optimal there were improvements throughout its duration. Continuing to implement these changes moving forward represents a significant opportunity for excellent future project relevance.

Sustainability

Project sustainability has been discussed in detail in Chapter 6, but from a VfM perspective it is vital to consider that longer lasting benefits have greater justification for their cost and generally represent better VfM. An important consideration is that with iMlango, the findings have shown that finance, or lack thereof, is the key determinant of whether schools will be able to continue iMlango activities. Due to the variation of cost between components outlined above, it is clear that the lower cost components, such as girls' clubs and teacher training, represent excellent VfM and their lower cost affords schools greater opportunity to maintain them. The provision of EdTech components in iMlango have been delivered in a manner that is difficult to sustain, largely due to their cost, and so comparatively represent significantly poorer VfM.

7.5 Conclusion

This section assesses whether iMlango has, and will continue to, offer VfM. Overall, it is clear the entire project was delivered at a high cost per beneficiary and cost per school. Although more detailed staff explanations were offered as to why specific components failed to offer VfM, there remained disagreement over whether individual components represented VfM. What is clear from the findings is that certain project components were delivered with greater cost than necessary, even if they achieved positive impacts on learning outcomes. However, recognising and overcoming these barriers creates an opportunity for greater efficiency and VfM to be delivered with project continuation.

What emerged from the budget data was a lack of a clear VfM narrative, in that there was a significant range in the cost per child per year that was highly variegated both between project components and iMlango as a whole. Although the more costly EdTech components were being delivered at a cheaper cost per child prior to Covid-19 compared to the outset of the project, these costs were still significantly higher than the cost per child needed to allow for sustainability and make the future iMlango approach financially viable. An essential next step for the project is to develop a clear process of how to make these necessary cost per child reductions, optimising resource allocation and reducing inefficiencies.

The rudimentary VfM findings demonstrate a lack of certainty over whether iMlango represents VfM overall, and this uncertainty was translated into VfM discussions on project components. Significantly, the lower cost components of the project that focused on

knowledge and teaching were viewed as offering good VfM. Higher cost components, despite recognition of their positive impact, were mostly viewed as poor VfM. It was recognised that project delivery and design could have been optimised and streamlined much more efficiently to lead to significant savings in achieving the same outcomes.

Sustainability is closely aligned with VfM and it is important to consider that schools being unable to sustain activities has a significant bearing on the VfM of these activities. Indeed, the schools' inability to continue project activities brings into some question the justification for the initial expenditure. Most notably, education licences, field staff, ICT maintenance, and internet provision and maintenance were delivered at a high cost per child rate, contributing to a position where at the end of the project, schools remain dependent on both external finance and technical support. Additionally, the assumption outlined in the ToC that schools will take initiative in project ownership is undermined by the dependency on high-cost elements of the project.

A future streamlined approach could offer significant improvements for VfM, particularly if inefficiencies relating to the previous consortium approach can be streamlined from inception. Overall, while the previous approach resulted in significant shortcomings in delivering good VfM, the future potential approach represents a clear opportunity to remove these issues and offer improved VfM.

Chapter 8: Analysis - scalability

8.1 Introduction

This section presents findings related to the opportunities for scaling the iMlango approach. First, by discussing first how iMlango is aligned with policy and the curriculum and other opportunities for integration and scalability, before being followed by reporting on the challenges to scalability (8.2). At the chapter's conclusion (8.3), the main findings are summarised and discussed. Findings in this section relate to the following research questions:

Table 21: Research questions related to project scalability

RQ #	Research question
Research theme 3: Project sustainability, VfM and scalability	
3.3	**Scalability:** To what extent is iMlango scalable? What scenarios exist for scaling the project, including implications of the Government of Kenya taking the project to scale? What are the opportunities and risks associated with scaling up the technology utilised in iMlango interventions?

The chapter therefore provides a platform from which to assess the assumptions of the Theory of Change, broadly that project activities are scalable after the project conclusion, and will lead to continued learning and transition outcomes that can be replicated in other schools in Kenya. This section draws solely on qualitative data, and the self-reported nature of the findings limits the extent to which conclusive judgements can be drawn about scalability. Nonetheless, it provides an indication of the extent to which project activities can be adopted and scaled after the project lifespan.

8.2 Scalability of the iMlango approach

This section presents findings on the opportunities and challenges to scaling the iMlango approach in Kenya, drawing on qualitative data. Firstly, the alignment of iMlango with government policy and the curriculum are presented, followed by opportunities for integration with other initiatives in addition to other perceived opportunities for scalability. Secondly, the importance of funding for scaling iMlango is outlined. Lastly, the challenges to scaling iMlango are presented.

Overall, four project staff reported they believe iMlango to be scalable, although they recognised that this is dependent on: appropriate planning (1 PS), being aligned with the curriculum and education sector (3 PS), and sufficient financial support (1 PS). However this was not a consensus view, 2 project staff members expressed they believed it could be challenging to scale iMlango at a national level.

Policy alignment

The main theme to emerge from the data was an overwhelming response that the iMlango project was well aligned with government plans in the education sector, and that this means opportunities exist for scalability. Seven project staff members articulated their belief that the iMlango project aligns with government ambitions to deliver technology and connectivity to schools for learning. This was strongly echoed by the school-level KIIs. In the interviews with MoE officials, all participants were asked about the viability of the iMlango model more widely across Kenya. Every interviewee replied positively, stating not only that they thought the model viable, but that they wanted to see it scaled to more schools.

However, not all interviewees recognised the MoE as being supportive of iMlango. One staff member reported that iMlango represents a different style of teaching to what the government is used to, which created some resistance. However, this view was countered by two project staff who reported the government is happy with iMlango and has shown an interest in scaling and sustaining it in Kenya. The reason cited for this was that the government sees digital learning as an equaliser for all learners, and that iMlango is specifically well aligned with DLP2 which is hoping to be scaled later this year. As one staff member mentioned:

> *… [the] project is a game changer in Kenya - there's a belief it's what children need. (iMlango staff, KII).*

Moreover, when asked about how well the iMlango activities aligned with the priorities of the education sector, all MoE officials who were interviewed responded positively. Not only did all six comment that it was well aligned, but three specifically stated that the project was well designed to align with the current syllabus, one commented that the programme provides one of the key components (digital literacy) of Kenya's Vision 2030 and another three also mentioned its relevance to Kenya's new Competency Based Curriculum (launched in 2017). For instance, one official said:

> *Learners who are ICT literate, even in our Competency Based Curriculum (CBC), one of the core competencies is digital literacy. So, through iMlango, we have seen our learners have learnt a lot of content using the iMlango devices and even how to manipulate these devices. How to open, how to close, how possibly to create something; and these learners, through these devices, actually have learnt a lot. (MoE official, KII).*

This assertion was supported by two other comments that the iMlango programme is especially pertinent in a 21st century context of globalisation, where students need to be ICT literate. Two final points made by the MoE officials were that the programme's content successfully supplements current textbooks (1) and that it never interrupted normal school programmes, only supported them (1). This demonstrates the extent to which iMlango is supported by the MoE and aligned with government policy.

Content alignment

Opportunities for scaling iMlango also exist due to the belief that the learning content is aligned with the curriculum (4 PS). Two staff members articulated that this is particularly due to the current curriculum being very focused on digital content. In addition, one staff member

further reported that worksheets distributed during the Covid-19 response were aligned with national radio and TV lesson content. Despite this, one staff member raised that although the government is keen on digital content, literacy and Maths-Whizz content might not be used when scaling digital content, which instead may be digitised versions of the current curriculum. Opportunities for scaling iMlango content therefore depend on its continued relevance to the curriculum.

Opportunities for integration

In particular, MoE officials suggested three ways to fuse iMlango with alternative initiatives. One suggested speaking with the Kenya Institute of Curriculum Development (KICD), in order to integrate iMlango within the CBC syllabus. A second official commented that a way to combine iMlango with the CBC would be to partner with teacher colleges, in order that other teachers benefit from digital training. A third asserted that iMlango could install its e-learning materials onto the government-provided devices already supplied to the majority of Kenyan schools. These, the official expanded, were:

> *[...] one of the manifestos of the jubilee government that they would supply, but it took a bit of time before they were supplied in schools. They had servers which had the digital content but it was not adequate then it was done in a hurry. iMlango schools benefited more, because they could incorporate the digital content of iMlango into whatever the digital devices carried. (MoE official, KII).*

The integration of iMlango learning content with government resources was therefore this official's suggestion, with the overall opportunity discussed by MoE officials that iMlango could be integrated with other education initiatives to be scaled.

Other scaling opportunities

Other specific opportunities identified for scaling iMlango were: the cardless monitoring system as it is simple and fast (1 PS), the online classroom instruction course (1 PS), and ambition from within the consortium to grow iMlango to 10,000 schools in Kenya (1 PS). MoE officials recommended training other teachers in ICT (2) and involving education stakeholders (1). One official suggested that the project offered the opportunity to create employment and reduce technophobia for teachers. Conversely, one official mentioned that one potential risk to scaling was that most of the schools in their Zone are not currently connected to the National Grid; however, they did state that the government has recently expanded the electricity connection, so they are optimistic. Finally, one MoE official commented that the (government's) DLP programme has not worked and did not have the required management capacity, so the comparable success of iMlango provided an opportunity for iMlango to take it over and implement it as a combined project .

Importance of funding

These opportunities for scaling iMlango are dependent on securing funding. Three MoE officials stated that iMlango should apply to the Kenyan government to sponsor the project, either by giving a contract to iMlango or by adopting the model. Furthermore, an additional official supplemented this suggestion by saying that it would likely save the government money

by substituting the cost of hard-copy textbooks with e-learning materials. However, other officials provided caveats to the government taking on the iMlango model. One stated that the government would be interested in scaling programmes *'where there is a donor'*, whilst another stressed that iMlango had succeeded so far due to being independently funded:

> *The donors - we will still require them and we would wish them to run the programme themselves, because they are independent. Why it succeeded is because it was run by an independent institution that could not be interfered with other things in the country. We would wish that they continue or make it even larger to cover all the schools. (MoE official, KII).*

The financial viability of scaling the project was therefore not wholly agreed upon amongst the respondents, and the source of external funding required to scale iMlango is unclear.

Challenges to scalability

Furthermore, despite a strong view emerging that the project was scalable and aligned well with national policy, interviewees identified numerous challenges to scalability. These were centred around four themes: the capacity of FOs, teacher resistance and use of resources, blended approaches to training and learning, and optimising school resources.

Firstly, three project staff members outlined the need for improving the capacity and use of FOs. Examples given by staff include needing more FOs (1 PS) and these FOs needing to be more locally available (1 PS). One project staff member argued more FOs should have a background in education and a better understanding of the psychology of teachers, in order to more effectively implement education objectives on the ground.

Secondly, three staff members reported the need for improved teacher engagement and training to ensure scalability. One staff member argued that a significant number of teachers in Kenya will be resistant to the project which challenges scalability. Teacher training that has been designed to overcome resistance issues therefore also needs to be successfully scaled to help overcome resistance. Other scalability challenges relevant to teachers are that some teachers rarely use the digital resources (1 PS), and that headteachers also need to understand the initiative for it to be successful (1 PS).

Thirdly, the need for blended approaches to teacher training was identified as essential (1 PS). They argued the teacher training delivered in schools was effective but not scalable as there were only 2 education advisors to 205 schools. They highlighted the need to change the approach to an online training model if it is to be successfully scaled. One staff member also identified that a blended online and offline approach for learning content is essential to ensure all could participate in the benefits of the project if it were scaled. The feasibility of this approach has been discussed in Chapter 6.4.

Lastly, three project staff identified that resource allocation in schools needs to be optimised if iMlango is to be successfully scaled. Three project staff, in addition to two MoE officials, identified that there should be more computers provided to schools, with one staff member outlining this is particularly the case for Class B schools. One staff member further reported

that not every school has access to power or ICT equipment, and that the limited access to resources presents a challenge of inclusive provision for students if the project is scaled.

8.3 Conclusion

This section assesses the key findings determining the extent to which iMlango activities are scalable. The findings of this chapter suggest that while clear opportunities exist for scalability, in particular due to the alignment of the digital learning focus and content of iMlango, there is a lack of conclusive evidence as to how the project would be scaled in a cost-effective manner.

The findings clearly demonstrate that iMlango and its content is aligned with government ambitions to use technology in schools to enhance learning. In particular, the positive response of all interviewed MoE officials is significant in confirming that the iMlango model is viable for scaling, and there is desire within the MoE to scale the project. In addition to being viewed as a standalone scalable initiative, opportunities have also been presented to scale iMlango through its integration with other relevant government initiatives (i.e. CBC syllabus). This positively indicates a variety of formats in which iMlango can be scaled within national education structures.

However, beyond this positive speculation, the findings did not provide a clear indication of a definitive process to scale iMlango. Despite the alignment of the content, it was inconclusive as to whether it would be scaled alongside the provision of project hardware. Additionally, the findings demonstrated uncertainty over whether the government will be able to take financial ownership of scaling iMlango. Significantly, two MoE officials recognised an external donor might be needed to ensure success in scaling the project. Despite being well aligned with government initiatives such as DLP2, its scalability is also dependent on the government confirming scaled digital learning initiatives in the near future, and it is important that MoE officials did not confirm the delivery of any upcoming initiatives that iMlango could be scaled with.

The data also raised key considerations for scaling iMlango, in order that the learning improvements it delivers are also scaled. These are summarised below:

- Scaling teacher training is essential to overcome resistance to iMlango methodologies in schools that will be introduced to the project during scaling.
- An online approach to teacher training needs to be adopted when scaling to ensure teachers can access the enhanced skills offered by teacher training.
- When scaling iMlango more computers should be provided in each school to remove the barrier of a lack of access to learning resources as outlined in Chapter 5.2.

Overall, the evidence confirms that significant opportunities for scalability exist. Most importantly, however, is that within the findings a definitive process for scaling iMlango failed to emerge, and so the findings remain speculative rather than conclusive. This is compounded by the recognition that the self-reported nature of this evaluation means that the findings cannot provide conclusive evidence of how iMlango can be scaled. It is clear that it is the level of appetite from the Kenyan government for integrating the project within the national

education strategy which remains the crucial variable in determining the potential for future scaling.

Chapter 9: Conclusions

9.1 Summary of conclusions

The endline evaluation has established the ways in which the iMlango project has contributed towards positive outcomes for girls in the intervention schools.

External circumstances have made the last 15 months particularly challenging for iMlango, as has been the case for all education programmes. Therefore, as stated at the outset, this is not the ideal time to evaluate the long-term impact of the programme. iMlango, like many, has worked hard to adapt to the challenges of school closures due to Covid-19. The programme responses have ranged in their effectiveness and it is important to acknowledge the inevitability of this.

The midpoint study highlighted specific challenges facing iMlango, providing recommendations for how they could be addressed. Over the last year the project team took on board many of these recommendations and should be commended for the actions taken. The programme has shown a commitment to learning and adaptation, and has been willing to take the hard decisions that will likely lead to increased positive impact in the long term.

As highlighted in the body of the report, there were a range of limitations and inefficiencies structured into the iMlango model at the design stage and these have continued to remain a challenge throughout. The current programme leadership have responded well to this and engaged with these challenges, taking difficult strategic decisions in order to give iMlango a more viable future.

One such challenge has been the rapidly changing EdTech landscape. Were iMlango to be launched in 2021 many foundational design and implementation decisions would be taken differently. At this current point of transition, the consortium members have an opportunity to reassess comprehensively the most effective way to achieve economy, efficiency, effectiveness and equity in each aspect of the programme in relation to current good practice in the use of technology in education. This opportunity can be approached with confidence, as Avanti and Maths-Whizz have demonstrated agility throughout and the ability to adapt to changing priorities. Both of these partners are clear on their distinct contribution and also recognise the way in which they have a more compelling education offering when working in combination.

The lack of a multi-point large-scale learning assessment as was originally envisaged means that it is not possible to have any independent statistically significant verdict regarding impact on learning outcomes. However, through the adapted methodology employed for the endline, the evaluation has found that the original project activities did lead to improved learning outcomes. The Covid-19 school closures acted as a significant hindering factor and led to learning losses, but these obviously cannot be attributed to iMlango activities.

With regard to literacy and numeracy, girls provided self-reported evidence of learning gains, although the KCPE results showed significant variation across the schools. Evidence suggests that activities have led to a greater impact on girls' performance than boys', due to the specific

attention paid to girls' education. Technology was said to be a major contributing factor to these improvements: the provision of hardware was highlighted as a major motivating factor for learning and the opportunity for students to become digitally literate was highly regarded. The online literacy and numeracy content (including Longhorn reading content, additional reading content, and the Maths-Whizz individualised simulated maths tutoring and digital whole-class maths content) were also considered to have led to improved learning outcomes and student enjoyment, although the former was considered to be a less strong component. Lack of equipment, challenges in electricity supply and internet connectivity as well as technical issues with devices, were all cited as limiting factors in the use of technology.

In addition to learning outcomes, girls' clubs and teacher training appear to have made a significant contribution to increases in girls' self-esteem and confidence. There is also evidence to suggest that the project has contributed to greater gender equality in the classroom. However, this was less observable than the positive shift in learning outcomes. There were some clear improvements in teachers' knowledge, skills and attitudes in using ICT for teaching and learning, and the iMlango portal and content were found to be significant resources in achieving this. Interview respondents articulated that ICT made teaching easier, and there were indications that the content enabled teaching to become increasingly learner-centred. Likewise, the role of field officers was recognised as a significant positive aspect, with training identified as a crucial means to increase teacher engagement with technology.

The findings also suggest that attendance and enrolment have improved over the course of the project, but these findings were somewhat inconsistent across the different sets of data. The most frequently reported barriers to attendance were factors such as the head of household's educational attainment, non-menstruation related sickness, a lack of money and family events.

There was insufficient evidence to assess the extent to which iMlango had made a contribution to improved rates of transition, although the self-reported findings do suggest a very high level of aspiration to transition to secondary school. Again, a lack of money was cited as the main threat to completing school.

The iMlango consortium's response to the Covid-19 school closures was inevitably not outlined within the project's original ToC. However, an assessment of the activities which took place during that period found there was limited demonstrable impact as a result of them. Lack of access to smartphones was a challenge, and there was limited uptake in usage of the app and WhatsApp communications. Moreover, the teacher training and involvement in project activities during this time provided mixed findings. As a result, despite some partial indications of learning progress (primarily among those who had access to technology at home), iMlango's response to Covid-19 was not found to build upon pre-pandemic learning outcomes and in particular it was unable to reach the most marginalised of the student population. Whilst this is the case, it should be noted that this was an 'emergency response' scenario and it would have been very difficult for iMlango to have a widespread positive impact on learning outcomes during the school closures of the last year.

The four main barriers to learning and transition that iMlango aimed to overcome through project activities were, poor KCPE results, a lack of tuition fees, pregnancies and early marriage, and the lack of perceived value of education and aspirations. Other barriers,

including teaching quality, access to technology and disability were identified during data collection. Findings during the evaluation suggest a complex picture with different barriers being addressed to varying degrees by project activities.

A lack of tuition fees, and pregnancies and early marriage, continue to be the main challenges to girls' education. Students often reported that a lack of money (for fees and school supplies) would stop them from attending school, affecting their attendance and transition. Despite the project's targeted interventions which have led to positive impact on student attendance and transition, directly contributing to easing financial barriers for girls' learning requires further on-going interventions.

Qualitative data suggests that teacher training, the implementation of technology, girls' clubs and ongoing community engagement are all core components of iMlango that should be sustained in the future. However, overall there are significant challenges to the future sustainability of iMlango in its current form. These relate to the fundamental financial difficulties of schools sustaining a technology-based project after the main source of funding stops, alongside the more day-to-day implementation challenges such as loss of trained staff due to teacher transfer, engaging with communities and the MoE, hardware maintenance, and disruptions to electricity and connectivity. The evidence demonstrates that while some project activities have contributed to sustaining learning outcomes, other project activities have hindered this process in their design and delivery. Most importantly, the removal of certain project activities that have enabled improvements in learning outcomes throughout the project threatens sustainability, as schools and county-level governance systems are not yet in a position to take ownership of these activities. It is clear that without further funding the majority of programme activities will not be sustained after the project ends.

The assessment of the project's VfM demonstrated that the cost per child of the programme is unsustainably high. Interviews provided a range of detailed explanations as to why specific components failed to offer VfM, but there remained disagreement among the consortium regarding the perceived VfM of each individual component of the project. What is clear from the findings is that certain project components were delivered at much greater cost than necessary, even if they contributed to having a positive impact on learning outcomes. A future streamlined approach could offer significant improvements for VfM, particularly if inefficiencies relating to the previous consortium approach can be addressed quickly. The extent to which a future streamlined approach could deliver at a much reduced cost per child depends on internal operating decisions, and the ability of the project to scale.

The findings of the endline evaluation also suggest that there are opportunities for scaling iMlango, although with a substantially altered operating model. iMlango was found to demonstrate clear alignment with the Kenyan government's ambition to integrate technology within education, and the learning content was well aligned with the curriculum.

The iMlango consortium has shown adaptability over the lifetime of the project, delivering activities that have created a positive learning environment for girls and demonstrated both the impact and potential of introducing technology into the Kenyan education system. There is much within the programme that warrants sharing and will be of use to the wider sector.

9.2 Validity of Theory of Change

This section comments on the validity of the Theory of Change as part of the contribution narrative. It is important to note that the limitations of the endline evaluation due to Covid-19 constraints on data collection means that the validity of the Theory of Change cannot be assessed in regard to the learning and transition outcomes. The focus of the endline evaluation was the project activities and their impacts and effectiveness at addressing the barriers to learning and transition faced by marginalised girls, as well as the overall sustainability of the project. As such, the assessment of the validity of the Theory of Change is based on these elements.

Overall, the project Theory of Change is found to be valid, appropriate and based on largely sound logic. This remains the case despite significant changes in the operating context and the resulting changes to activities, as well as the assumptions underpinning the Theory of Change.

Regarding the impact of project activities on the learning and transition of marginalised girls, the Theory of Change is seen to be partially valid based on the evidence collected at endline. The appropriateness of some project activities is evident as they address identified barriers to transition. The girls clubs were stated as being influential in improving the life skills of the girls, specifically building confidence and creating a safe space to grow. The introduction of ICT into schools, in combination with the training provided to teachers has contributed towards both the improved quality of teaching in schools as well as encouraging improved attendance for students. There was self-reported evidence of learning gains among girls, however external evidence, such as the KCPE results, did not corroborate these findings, and there was insufficient evidence to be confident that girls' transition rates have improved across the schools.

Regarding the barriers to learning and transition targeted by project activities, the evidence suggests that those identified in the Theory of Change are appropriate and relevant. However, the evaluation has highlighted that additional barriers could have been included within the Theory of Change at the outset. These include the quality of teaching within the schools, the lack of access to ICT and poor stakeholder engagement. A lack of financial resources remained the most significant barrier to girls' access and completion of school. The evidence suggests that the activities directed at addressing this barrier were insufficient and should be reviewed. Evidence of other activities, such as the introduction of Maths-Whizz, the training in and provision of ICT to teachers, girls clubs and community engagement, suggests that these project activities are contributing towards the changing barriers to learning and transition for girls, although they are not sufficient to fully overcome them alone.

Regarding the sustainability of the iMlango project, the Theory of Change does not clearly articulate a pathway from activities to sustainability. Evidence from the endline evaluation suggests that the iMlango approach has some elements which have contributed to its sustainability, such as teacher training, girls' clubs and community engagement. However the overall sustainability of the programme faces significant challenges. These largely relate to the financial difficulties faced by schools in maintaining a technology-based project without provision of external financial support. The Theory of Change requires additional pathways

(activities to intermediate outcomes) to address these technological and financial barriers in order to more fully address the significant challenges faced by the communities and ensure long-term impact for girls' education.

Chapter 10. Recommendations

10.1 Recommendations for the strategic future of the programme

Actively align iMlango with the UK government strategic focus on girls' education. The strong emphasis on girls' education provides an opportunity and a challenge for iMlango. It is recommended that iMlango actively engages in the GPE Global Education Summit in London in July 2021 as an opportunity to demonstrate the future potential of the programme.

However, in order to make the most of this and other opportunities, it is necessary to make substantive and rapid changes to the programme. **Streamline and simplify the iMlango offering** so that the programme can be positioned clearly as a cost-effective solution to improving numeracy outcomes at scale through online learning. This should lead to a more viable financial model and an increase in learning outcomes. **This will require a fundamental reworking of the cost model**: to be compelling as a scalable offering that provides accessible VfM it will be necessary to reduce the cost per child to less than £10 per year.

Demonstrating that this can be done, in a way that will be compelling and attract significant future financial backing, requires the programme to be able to calculate and quickly show the cost per child of **the future-focused streamlined version of the programme.** This should be both for the immediate and also for the potential cost per child when operating at scale, with the suggested target figure of less than £10 per child per year as noted above. Combine this new projected cost model with the pre-existing Whizz data on projected impact on learning outcomes. These two can then be integrated in the form of a 'cost per LAYS' equivalent. This will become the central figure that is used when promoting the programme to potential partners and funders.

From a review of the data accessed, combined with the questions asked in interviews, it appears that there is a substantive difference between the offerings provided by iMlango in relation to numeracy and literacy. The literacy component appears to be relatively static and provide basic content. The numeracy content, provided by MathsWhizz, is based on many years of experience gained prior to iMlango of how to use technology effectively to personalise numeracy learning for students. It is therefore not possible to present iMlango as a programme that is equally weighted towards numeracy and literacy: the numeracy component is more technically advanced and more likely to lead to long-term impact on learning outcomes. This is what leads to the recommendation that **the future programme will have maximum impact by pursuing numeracy-related activities.** As noted previously and agreed at the design phase, it was not possible to collect external data through conducting learning assessments in relation to either the numeracy or literacy components of the programme. It should therefore be noted that this recommendation is not solely based on the empirical evidence collected through the endline evaluation methods, it also draws on the wider expertise of the external evaluation team regarding the EdTech sector and recognised good practices within it. This is appropriate

in light of the study design and practical constraints, and focus on the future possibilities for the programme.

In addition, these changes require **systematising the offering of iMlango** so that good practice can be spread across all participating schools. There have been noteworthy examples of sustained good practice in many schools, but it has not yet been possible to embed this fully across all schools. It may be necessary to work with a much smaller group of schools during this period of programme transition. The emphasis in these schools should be on maintaining the quality of service, refining the new offering and strength-testing it so that the programme builds new technical insight and is ready to scale at the appropriate time.

During this period of transition, it is vital to **develop a clear, realistic and compelling strategy for the future**. If the programme is to thrive and scale its new approach, then it will need a small dedicated team to determine the detail of the new offering, how it will be delivered and what it will cost. There is a small window of opportunity - the next several months - where the momentum of the programme can be sustained, and it will be necessary to **act swiftly in order to capitalise on this, avoid the programme drifting into obscurity, and instead create a compelling model for the future.**

When the opportunity comes for expanding again, the programme should be very careful in identifying which schools should participate. For the iMlango offering to be distinct it needs to focus on its unique competitive advantages - one of which is in providing connectivity to enable learning in remote regions. It is therefore likely that iMlango is best placed to **focus on schools in remote rural regions** where there is not likely to be an alternative connectivity option available in the next few years.

10.2 Specific technical recommendations for the future of the programme

As noted, iMlango engaged in a wide range of technical innovations, with varying degrees of effectiveness. The following recommendations focus on specific technical options that should be considered for the future of the programme.

Continue with girls clubs and build on this positive impact. There was consistent positive feedback regarding the impact of girls' clubs. It is clear that they are effective in building confidence and self-esteem. Keep the girls' clubs prioritised within the future iterations of iMlango. It is not yet clear what it is that makes them particularly effective, and this should be further explored to consolidate the good practice. Consider whether the approach to girls' clubs could also be systematised and shared as a 'manual' global public good.

For future home-based learning, include non-smartphone options. For any future innovations related to home learning, either linked to school closures or other factors, iMlango should try to create access routes for students which reduce dependency on each family having access to a smartphone, as this will not be the case for the most marginalised, especially in predominantly poor and rural communities. It is worth considering what the low-tech offering could be for the programme to facilitate more accessible home-learning.

Consider making the online training for maths teachers into an open access resource. This would mean that other teachers not part of iMlango can benefit from it and so that iMlango is making a visible contribution to building global public goods on leading-edge teaching resources.

Communicate clearly and quickly with schools regarding the ways in which the programme is changing and the reduction in activities in line with the clear closure processes provided by the GEC FM**.** The evaluation has highlighted the fact that many of the people in iMlango schools do not know that the programme is ending, and the large majority do not have plans in place. This is consistent with several other GEC projects where - despite the central guidance provided - there is a lack of clear and formalised support processes for how programmes should close at the school level. This has understandably been made more difficult by Covid-19, but still remains a priority now and for future programming.

Explore if it is possible to expand the range of the internet coverage within schools. The potential impact at the school level would increase significantly if there was reliable high-speed provision throughout all classrooms rather than coverage, in certain schools, being limited to a small number of rooms.

Continue the focus on online content, but consider complementing with offline resources. The reliable provision of online learning content is a positive and central part of the iMlango offering. However, the events of the last year have demonstrated the limitations in terms of accessibility when faced with home-based learning. The programme should consider its blend of online and offline learning content. There is clearly a trade-off to decide between high accessibility and high personalisation. The iMlango brand is based on connected education, so the recommendation is that the programme pursue a primarily connected approach, while introducing a suitable back-up of robust offline back-up to reduce dependency on the connectivity option.

Build on the good foundation of training already provided and increase the focus. There has been consistent evidence across the evaluations that increased teacher training is a significant factor that leads to increased uptake and integration at the school level. Effective training to embed new practices and provide an actual change in pedagogical approaches requires significant and sustained input at the school level. iMlango did prioritise this but it would have been beneficial to do more so, and in future when expanding to new schools this should be fully integrated from the outset. Specifically, teachers need coaching both on the use of the technology, and on the pedagogical vision of the programme - one without the other is not effective. Head-teachers need to be fully integrated with this training programme, and also should have additional training on how to most effectively integrate use of the technology within the on-going rhythm of the school day by day.

Increase the expertise and capacity on gender, inclusive education and safeguarding within the staff team. In recent years iMlango made significant progress in relation to gender experts and prioritising safeguarding. However, it would have been beneficial if these were budgeted from the beginning of the programme, rather than being incorporated part way through. In addition, although progress was made, there was still a lack of safeguarding capacity across the programme and this should be increased for the future.

Invest in more robust tracking of beneficiaries as a core aspect of project management rather than as an evaluation related add-on. It has been challenging throughout the evaluation to ascertain accurate numbers of project direct and indirect beneficiaries per year. This is a somewhat surprising challenge for an EdTech intervention and can be easily addressed in the next iteration of the project.

10.3 Recommendations for the design and implementation of the programme

iMlango has been somewhat hampered by structural design decisions taken at the outset of the programme that - at times - made it difficult to adapt to changing context and priorities. It would be valuable for the FCDO and the FM to consider making structural changes to the design of future large-scale EdTech programmes based on the experience of iMlango. Specifically, it is advisable for any programme, especially a consortium-based one such as iMlango, to reduce the number of long-term contractual commitments made at the outset in order to increase overall efficiency. Two specific examples relating to iMlango are the challenge caused by agreeing long-term licencing fees at the outset, and agreeing how hardware would be supplied to the schools. The pace of change within the EdTech sector is rapid and new programmes, especially donor funded ones, benefit from being structured in such a way that they are both able and motivated to proactively respond to changing contexts. This has been hindered in iMlango - as in many other programmes - by being tied into long-term contracts which prescribe a specific approach and prevent adaptation. A **more adaptive programme design** would likely have led to a more cost-effective impact on learning outcomes.

Despite the deliberate experimental design of iMlango, in hindsight it is clear that the programme was disproportionately weighted towards these experimental components. The overall effectiveness and specific VfM on the programme would have been increased if the number of the experimental components had been reduced earlier - based on rapid evidence gathering to assess their effectiveness - and a more streamlined approach adopted. Similarly, the structure of the consortium was convoluted, and in the latter stages it has become apparent that it would not be possible to resolve the fundamental tensions regarding the future and focus of the programme. Future related programmes should consider a **simpler design with a more deliberate focus on fewer experimental components**.

iMlango has been a major part of the GEC Strategic Partnerships window. This window has had a mandate to explore new approaches to girls' education, and iMlango has operated in alignment with this. Each aspect of this has had consequences, both positive and negative, for the effectiveness of the programme. The recommendations here engage with a specific consequence relating to the co-funding of the programme between FCDO and the consortium partners. The co-funded structure of the programme, combined with the lack of an achievable cost recovery model meant that some consortium partners are likely to have inflated budget lines. Future programmes should anticipate this when using innovative financing mechanisms with private sector suppliers who have a legitimate need to cover costs. It is likely that iMlango would have achieved greater VfM **if FCDO had required transparent full economic costing** on

all of the day-rates of programme staff, and clarified the maximum profit margin on these from the outset.

10.4 Recommendations related to programme evaluation and wider learning of sector

The Maths-Whizz platform and associated data provided real-time insights of student learning and this could have been incorporated more effectively to make iterative evidence-based changes across the programme. However, the initially prescriptive structure of evaluation required by the GEC (learning assessments at baseline, mideline, endline) meant that iMlango was not built in a way that capitalised on the potential for on-going project MEL. Future evaluation frameworks for EdTech interventions could be more willing to **incorporate the potential of technology (such as real time learning data) within their evaluation design**, rather than relying solely on formal and periodic assessment points through established methods.

The experience of iMlango has been highly valuable for the EdTech sector, and for the broader efforts to increase the effectiveness of how technology is used within education programmes. It is the associated learning products - more than this endline evaluation - that are most valuable for the sector in terms of capturing and communicating all that has been learned. There is much within the iMlango programme that should be shared widely, as global public goods, to promote good practice within the sector. Three specific contributions to global thought leadership are: insights from Whizz on the nudge-factors that increase the effectiveness of a learning platform, the insights from Avanti on how to enable and maintain connectivity and the associated potential benefits within low-income contexts, and the insights from across the consortium regarding how to realise the benefits and overcome the challenges of multi-sector partnerships for delivery of effective EdTech programmes. These, and other insights, **provide leading edge technical thought leadership that can help shape the sector - they should be published and made widely available.** This is already underway and can be prioritised through the learning products associated with the evaluation process.

As previously noted, this is not the ideal point in time to conduct a summative evaluation of the programme. Disruptions from Covid-19 and the associated periods of school closure have meant that, inevitably, iMlango is currently having much less impact than would have been the case in normal circumstances. Assuming that iMlango activities continue in some form, it would be advisable to hold some form of **light-touch evaluative review after a period of 'normal' operating conditions** in the associated schools.

It is in the interests of all parties (iMlango, FM, FCDO, Govt of Kenya) to **continue to track iMlango schools to understand their future participation and performance** now the full service is no longer in place. In addition, there will be significant sector-wide interest in understanding a) the factors that most enable in-school activities to continue even without the normal support b) whether and how schools successfully adapt to independent use of the

technology in a financially sustainable way and c) the long-term impact on girls from iMlango schools in terms of transition and future employability.

Annexes

Annex 1: Project Design and Intervention

[ATTACHED AS A SEPARATE DOCUMENT]

Annex 2: Endline evaluation approach and methodology

This section presents the methodological framework and stages, the enumerator recruitment and training process, the sequenced approach to data collection and analysis, and details regarding the target beneficiaries, the data sources, sampling strategy, quality control, and analysis framework.

The methodological approach for this evaluation transitions through three iterations before settling on the approach outlined below. This was required in response to the changing global context as a result of Covid-19 and a reduced time window for conducting the data collection. MoE's refusal to allow in-person data collection resulted in the final methodological pivot to the remote approach outlined below.

Overview of methodology

The structure of the methodology is based on the research priority areas shared by the iMlango Evaluation Review group during the inception meetings. The study will utilise a participatory and mixed methods approach, sampling from the same schools as in the baseline evaluation. The endline will interrogate the assumptions behind the Theory of Change and the links between activities, intermediate outcomes (IO) and outcomes. It aims to assess if changes have occurred, and if so, what has caused these changes. To assess the validity of the assumptions between the intermediate outcomes and learning and transition outcomes, a combination of quantitative analysis, qualitative analysis and wider research in the education sector was used.

A decision was made in conversation with Avanti and the FM to pivot the data collection to be fully remote in early February 2021. This decision was the result of conversations with the Ministry of Education (MoE) who was unable to provide permission to collect data in schools. The MoE has since provided permission to collect data remotely. While the overarching aims and objectives of the endline research did not change, the decision to undertake remote data collection resulted in necessary changes to the number of research questions that the data sources can realistically and rigorously collect data on, the data sources, the sample sizes of the instruments, and the length of the tools themselves.

The endline has continued to use contribution analysis as the conceptual framework of the study. The research also maintained a participatory, mixed methods and cross-sectional approach to data collection and analysis as was articulated in the previously accepted

inception report. However, some adjustments were made to the methods in consideration of the pivot to remote data collection and necessary changes to research questions and available data sources with which to explore these questions. A summary of these adjustments is included in the list below:

1. **Removal of comparison schools** because of limited time available to collect remote data and ethical considerations around asking girls to participate in phone surveys who did not have an opportunity to benefit from the project interventions.
2. **No cohort tracking** as we are not making a comparison with midline and baseline due to interrupted implementation and a change in circumstances.
3. **Reduced number of treatment schools in the overall sample** due to the logistics of remote data collection in order to retain the number of tools we would like to administer (i.e. in deciding whether to have more schools and less tools or less schools and more tools, we decided the latter would provide richer data in a school-based study approach).
4. **Reduced sample sizes for individual tools** because of the length of time needed to conduct remote surveys and interviews and make contact with participants. Note that this will mean that the sample will not be representative of the beneficiary population, but indicative.
5. **Removal of FGDs and lesson observations** as these are not possible to conduct remotely. Interviews were conducted over the phone in order to ensure these voices were included in the evaluation.
6. **Streamlining the remaining tools** to meet the requirements of reduced time per tool for remote data collection. Sector guidance, in addition to our experience conducting similar evaluations, is 20 minutes on the phone with girls and slightly longer (20-30 minutes) with teachers, headteachers, BoM members, and MoE officials.

Methodological limitations

There are four headline methodological limitations that the reader should keep in mind when reading the study. They were agreed within the evaluation design and have been unavoidable because of the current context, but it is important to highlight them at the outset to ensure that the report analysis is understood correctly.

- Throughout the text the reader should take note of the methodological limitations of the study, namely the reliance on self-reported, and perception-based data. The data has been triangulated wherever possible to increase reliability, but it should be made explicit that this is not a fair proxy for having conducted large-scale learning assessments as originally conceived within the GEC evaluation framework. As is known, the baseline study for the iMlango evaluation (not conducted by Jigsaw) was not executed effectively and did not provide the foundational data-set that was required in order to implement the anticipated three-point longitudinal assessment of numeracy and literacy outcomes. This has been a limitation of the iMlango evaluation throughout. This long-term limitation was further compounded by the inability to access schools in-person for the endline data-collection because of Covid-19 restrictions.

- In addition, the lack of a functioning control group means that it has been very difficult to determine causality within the data that has been analysed. That is to say, it has not always been possible to ascertain whether it is iMlango inputs, or that of another source, that has led to the outputs and outcomes observed. This warrants a degree of caution in interpreting all the findings, and is the justification for engaging in contribution analysis rather than attempting direct attribution analysis which would have been unrealistic in the circumstances.
- Similarly, because it was not possible to visit a randomised selection of schools in person, there should be a degree of caution in extrapolating the findings - both positive and negative. That is, what was reported in the iMlango schools included in the endline data collection is not necessarily representative of what took place in all iMlango schools.

Finally, throughout the analysis there is on-going reference to the interviews with key informants. It is inevitable that no interviewee has an entirely objective assessment of iMlango, and each of them bring their own biases. In a conventional endline study, the bias within individual responses would be mitigated or diluted by conducting a larger number of interviews. Because of the methodological restrictions in place, it has been necessary for the study to be unusually dependent on a small number of interviews. Therefore all the analysis of the key informant interviews should be read with this limitation in mind.

Contribution analysis

Originally, the multi-year external evaluation utilised a quasi-experimental methodological framework, with the baseline following this approach. As this approach was no longer feasible for the endline evaluation, an alternative methodological framework was used. Contribution analysis was selected in conversation with Avanti and the FM, as an appropriate analytical approach given the context of the endline evaluation. The following definition of contribution analysis was used:

> *"Contribution analysis is a methodology used to identify the contribution a development intervention has made to a change or set of changes. The aim is to produce a credible, evidence-based narrative of contribution that a reasonable person would be likely to agree with, rather than to produce conclusive proof."*

Contribution analysis is an appropriate alternative theoretical framework for the endline evaluation for the following reasons:

- There are external factors that influence the changes experienced by project participants, and there are other development interventions being implemented in Kenya. This approach recognises that it is difficult to prove attribution for these reasons and assumes that there are usually multiple contributory factors to change.
- Contribution analysis is designed to be used alongside theories of change that explicitly set out how change is supposed to happen, as the project has done. Contribution analysis assesses changes at the different levels of the Theory of Change in order to compare reality with the theory.

- As it is not possible to track a cohort and use a control group, contribution analysis is appropriate as it seeks to reduce uncertainty about change and to help explain how and why changes occurred.
- There has been a significant enough period of implementation of the pre-Covid-19 activities for change to occur.

Contribution analysis follows six steps of implementation, which are outlined below and applied to the endline evaluation process.

Table 32: Six steps to contribution analysis

Contribution analysis steps	Endline evaluation process
1. Set out the question(s) to be addressed	Completed in inception phase in consultation with project and FM, and outlined in inception report
2. Develop a theory of change	Developed by project at baseline Determine how the theory of change was maintained and changed for the Covid-19 response
3. Gather existing evidence	Research on context (national policy, other interventions etc.) Analysis of project monitoring data Primary data collection: Phase 1 Primary data collection: Phase 2
4. Assemble and assess the contribution narrative	Analysis of primary data Draft endline evaluation report
5. Seek out additional evidence	First project feedback round on draft report
6. Revise and strengthen the contribution narrative	Second project feedback round on draft report FM feedback round on the draft report

As articulated above, step three of the contribution analysis approach was further strengthened by a mixed-methods data collection approach. This involved exploratory cross-sectional survey data collection, which helped to describe the evaluation context. Alongside the survey, semi-structured interviews were used to explain some of the survey findings, as well as to explore topics and the views of informant groups that the survey did not cover. After data collection, a contribution analysis analytic framework was employed. Within this framework, the results of statistical survey data analysis, qualitative analysis of the interview data, as well as project monitoring data and other relevant literature were used to help establish the contribution of the iMlango interventions.

Enumerator recruitment and training

Selecting enumerators

The proposed research will have the core Jigsaw evaluation team working alongside RDM, an enumerator team that is based in East Africa. RDM is a reliable partner that Jigsaw has worked with on several GEC evaluations. A team of enumerators will be recruited through the RDM researcher pool who are based in Kenya and have the necessary language skills and contextual knowledge to undertake research in the four counties that iMlango operates within. Prospective enumerators will be required to provide a CV, police check and reference check and participate in a short phone interview. The CV assessment and interviews will be conducted by RDM, with oversight from the Jigsaw team. Successful candidates will be invited to the training phase. Candidates will be prioritised based on their previous data collection experience, language skills, and experience working with children.

Overview of training

A three-day training and one-day pilot will be conducted immediately prior to the data collection period. During training, the data collection teams will be thoroughly trained in how to implement the student survey and how to lead FGDs and KIIs and collect data in a rigorous and reliable manner. Training will include:

- Introduction and familiarisation with tablets and digital tools
- Introduction and familiarisation with surveys
- Survey practice
- Discussion of KIIs and FGDs, including guidance for note-taking and transcribing interviews and focus groups
- Data collection protocols, including sampling and communication
- Safeguarding protocol for children and adults
- COVID-19 protocol
- Insights regarding conducting research during COVID-19 (it is anticipated that two or three enumerators from another GEC-T evaluation that Jigsaw is partnering with RDM can join this section of the training to share their experiences and insights regarding strengths and challenges of the approach)

In addition to the above, Jigsaw will incorporate quality control into the training. During data collection, there are three important quality control factors: accurate and consistent administration tools across the data collection team; the ability to handle several tasks at one time (including listening to the student, inputting answers and operating the tablet); and using a child-friendly, sensitive approach. The training phase will therefore include a variety of activities to help enumerators administer the surveys correctly, and ensure the qualitative data collection specialists can conduct FGDs and KIIs confidently and consistently, using participatory and child-friendly methods. These will include:

- Facilitators modelling correct and incorrect behaviour
- Inviting enumerators to demonstrate to others
- Working in pairs and small groups to practice and giving feedback

- Inter-rater reliability testing (see below)
- Review of outputs from participatory methods and how to record them
- Practice KIIs and FGDs
- Review of practice KII and FGD transcripts for accuracy

An inter-rater reliability (IRR) test will be used to measure how accurately enumerators mark the student survey responses, and the consistency between enumerators. The IRR test involves two co-facilitators playing the role of student and enumerator. The 'student' uses a script that specifies a response to each question, and the enumerators score responses as they have been trained. Following the test, the Jigsaw team will download the data and calculate the IRR scores. Scores will be shared with the trainees individually to discuss any issues and encourage learning.

Data collection sources

The endline data collection involves varied sources, with beneficiary voices central to the methods. The target beneficiaries for data collection include direct and indirect beneficiaries as well as non-beneficiaries who may offer a valuable alternative perspective on the impact of the project. The sample will include 32 of the same 85 iMlango treatment evaluation schools as were sampled at baseline, including pupils, teachers, headteachers, BoM members and caregivers. In addition, data sources will include local MoE representatives and project staff.

The table below presents the details on each data source, including a description of the data and how it will be collected as well as the number to collect and associated RQs where relevant. These sources are also discussed in further detail in the sampling strategy section. Once a finalised list of schools for the sample is provided, the number to collect will be updated.

Table 4: Data collection sources

Phase	Data source	Detail	RQs
1	**Document review**	A comprehensive review of project background documentation. This will be conducted by the Jigsaw team.	N/A
2	**Monitoring data**	Attendance and app data from sQuid, Maths-Whizz Tutor data, literacy data, and other usage data where available and relevant to the RQs. Analysis of this data will be conducted by the Jigsaw team in conversation with and with the support of iMlango consortium partners.	1.1, 1.4, 1.5; 4.2; 5.5
3	**Student surveys (treatment schools)**	Student surveys will be conducted by the enumerator team in all sampled treatment schools.	1.1, 1.2, 1.3, 1.4, 1.5, 1.6; 2.1; 5.1, 5.3, 5.5

4	**Student KIIs (treatment schools)**	Student interviews will be conducted by the enumerator team in 50% (16) of sampled treatment schools.	1.1, 1.2, 1.3, 1.4, 1.5, 1.6; 2.1; 5.1, 5.3, 5.5
5	**Teacher KIIs (treatment schools)**	Interviews with teachers in 50% of sampled treatment schools will be conducted by the enumerator team.	1.1, 1.3, 1.4, 1.5, 1.6; 2.1, 2.2, 2.3, 2.4, 2.5; 4.1; 5.1, 5.3, 5.7
6	**Headteacher KIIs (treatment schools)**	Interviews with headteachers from all sampled treatment schools will be conducted by the enumerator team.	1.5; 2.1, 2.2; 3.1, 3.2; 4.1; 5.1, 5.3, 5.4, 5.5
7	**BoM school KIIs (treatment schools)**	Interviews with BoM members from all sampled treatment schools will be conducted by the enumerator team.	3.1, 3.2; 4.1; 5.1, 5.3, 5.5
8	**MoE representatives KIIs**	Interviews with local MoE representatives (CDEs, CSOs or DEOs) will be conducted by either the enumerator team or the Jigsaw evaluation team.	3.1; 4.1, 4.3; 5.1, 5.3, 5.4, 5.5
9	**Project staff interviews**	Interviews with project staff will be conducted remotely by the Jigsaw evaluation team.	1.6; 2.1, 2.2; 3.1, 3.2; 4.1, 4.2, 4.3; 5.2, 5.3, 5.4, 5.5

Responsibilities for data collection

The enumerator team will be given the school's contact details to coordinate data collection through the school with logistical support from iMlango project Field Officers. RDM will collect the data from schools via student surveys, student KIIs, teacher KIIs, headteacher KIIs, and BoM member KIIs. Jigsaw will conduct data checks and will clean and analyse the data with support from the enumerator team where required. For interviews with local MoE representatives, a member of the iMlango team will facilitate introductions. These interviews will be conducted by either the enumerator team or Jigsaw and are likely to be conducted remotely. Jigsaw will conduct all interviews with project staff, with the support of Avanti in selecting appropriate participants.

Overview of data collection activities

Data collection tool	Total number collected
Student survey	384 (12 girls per school x 32 schools)
Student interview	16 (1 girl per school x 16 schools)

Teacher interview	16 (1 teacher per school x 16 schools)
Headteacher interview	8 (1 headteacher per school x 8 schools)
BoM member interview	8 (1 headteacher per school x 8 schools)
MoE official interview	4-8 (1-2 officials per region x 4 regions)

Sampling strategy

The sampling strategy will utilise the strategy used during the baseline evaluation. The sampling strategy for each data source is described in the sections that follow, presented by student, caregiver, teacher, school administration, and project-level data.

Student surveys

12 student participants for the surveys will be sampled from each of the 32 selected treatment schools (8 per region - 4 A/C schools and 4 B schools). This equates to a total of 384 student surveys, which is considered to be an appropriate sample size to establish trends and relationships in the data, while allowing for freedom for in-depth statistical analysis. These will be conducted remotely by the enumerator team and will last approximately 20 minutes. Girls who have participated in phone surveys should not be asked to also participate in a phone interview.

Student interviews

Qualitative student data will be collected through remote KIIs with one student in half (16) of the sampled treatment schools. This will include 4 interviews per region (2 in A/C schools and 2 in B schools in each region). These will be conducted remotely by the enumerator team and will last approximately 20 minutes. Because we are no longer engaging in cohort tracking, interviews will only be conducted with students at the primary school level, however this will seek an indicative sample based on the original transition cohort where possible - i.e. either from the original S2 cohort or indicative of S2, S6 or S7 cohorts. Girls who have participated in phone surveys should not be asked to also participate in a phone interview.

Teacher interviews

Qualitative teacher data will be collected through remote KIIs with one teacher from each of the same 16 schools as will be sampled for the other qualitative data collection. This will include 4 interviews per region (2 in A/C schools and 2 in B schools in each region). These will be conducted remotely by the enumerator team and will last approximately 30 minutes. Participants should be half male (8 teachers) and half female (8 teachers) if possible and should have been teaching at the school for at least two years. All participants should either teach Maths or English.

Headteacher interviews

The headteacher (or other school leadership member, where the headteacher is unavailable) will be interviewed in 8 schools for qualitative data collection. These interviews will be conducted remotely by the enumerator team and will last approximately 30 minutes.

BoM member interviews

In the same 8 schools as the headteacher interviews, 8 BoM members (i.e. one per school) will also be interviewed for internal triangulation. These interviews will be conducted remotely by the enumerator team and will last approximately 20-30 minutes. The BoM member should have been involved in the school for a minimum of two years.

MoE official interviews

4 to 8 local MoE representatives will be interviewed to represent the different counties of project operation (i.e. one to two interviews will be conducted for each county). Introductions to appropriate individuals will be made by the iMlango team. These interviews will be conducted by the enumerator team and will last approximately 20 to 30 minutes. The official should have been in their role for a minimum of one year in order to provide detailed reflections regarding the project impact.

These will be the last interviews to be conducted by the in-country enumerators as they can be collected after schools have closed for exams.

Project-level data sample

Qualitative data will be collected from project-level key informants through in-depth interviews conducted remotely by the Jigsaw evaluation team. Sampling will be purposive in conversation with the iMlango Evaluation Review Group. Interviews will be requested with representatives from all relevant partners to ensure that the consortium is represented in full and there will be an equitable distribution of voices. This will also include interviews with Field Officers. It is anticipated that approximately 15 interviews will be conducted (or until thematic saturation is reached), with interviews lasting approximately 60 to 90 minutes.

In addition, project-related background documentation will be analysed including documentation regarding project costs for the value for money analysis, which will be provided by the iMlango consortium.

Schools included in the sample

32 schools out of all evaluation primary schools were randomly selected for girls' surveys (8 per region including 4 A/C schools and 4 B schools). Out of these 32 schools, 16 were randomly selected for student and teacher interviews (4 per region including 2 A/C schools and 2 B schools). Out of these 16 schools, 8 were randomly selected for headteacher and BoM member interviews (2 per region including 1 A/C school and 1 B school). I.e. out of the 32 randomly selected schools, all will have girls' surveys, 16 will have girls' surveys as well as student and

teacher KIIs, and 8 will have girls' surveys as well as student, teacher, headteacher and BoM member KIIs.

A separate excel spreadsheet has been created to house all schools included in the sample. In addition, four regional tables have been inserted as annexes for the enumerator training guide for remote data collection. If there are any issues in contacting the schools, a school should be replaced by an indicative school (e.g. if you are replacing a B school in Kilifi, you should find another B school in Kilifi to take its place). A tab has been included on the spreadsheet with all treatment evaluation schools to select back-up options from.

Approach to data analysis

Quantitative analysis

Once the data had been checked for outliers and inconsistencies, some variables were re-coded, as well as new variables created. Specifically, some ranked variables (including and beyond Likert scaled variables), were reverse coded to enable more intuitive analysis. Further, new variables were created to capture information not easier accessible in the original questions. An example of this is the 'disability' variable which allows the students with different (and sometimes multiple) disabilities to be compared across the dataset. A more detailed list of variables that were re-coded, and created, can be found in Annex 11.

After data cleaning, the survey data were explored through statistical analysis in R. The analysis can be roughly grouped into two categories: descriptive and inferential. Descriptive analysis was conducted on most of the questions in the survey to explore the frequencies with which each response was given. These frequencies were further disaggregated along grade, county, and type of school (where applicable) to explore the relationships between a response (such as 'Yes' or 'No') and these factors. The statistical significance (p) of the relationships explored in these disaggregated frequency tables–otherwise known as crosstabs-were tested using chi-square tests (an inferential test). The chi-square test statistic (X^2), alongside the p-value, therefore revealed whether the frequency of responses in the type of school that were considered (Type A/C and B) were the result of more than just chance. Other descriptives were also explored, as appropriate, to explain trends in the data. Most commonly, these included using measures of central tendency (namely the median and mean) to find the average (such as with 'Age').

The second category of analysis, inferential analysis, were predominantly conducted when there was a need to explore the relationship between one, or multiple 'predictor' variables (such as, for example, different types of iMlango activities) and an outcome variable (such as, for example, learning progress). At least one of the variables explored in these analyses tended to be continuous or ranked (such that a response can be ordered from high to low: e.g. 1st, 2nd, 3rd) as opposed to categorical (such that a response cannot be ordered: e.g. Male and Female). Various types of regression and correlation analysis were primarily employed, with the choice of which type of regression or correlation to conduct dependent on the types of data (e.g. categorical, ranked or continuous), combinations of types of data in the analysis and the statistical assumptions that needed to be met to allow for rigorous analysis.

A number of statistics are reported as part of the regression result. These include the beta values (β), or log odds (LO), alongside corresponding p-values, which are reported to explain the degree to which an outcome variable changes for every point change in a single predictor variable (positive values indicate positive correlations while negative values show negative correlations). The beta value provides detail on individual predictor variables within a model. Similar to β scores, odds ratios are also reported where relevant, along with the related p values. Notably, keeping with the standard practice within GEC evaluations, across all of the statistical tests conducted, p-values of 0.05 or less are considered as statistically significant, those between 0.05 and 0.07 are considered as marginally significant and those above 0.07 are not considered as significant.

Qualitative analysis

Thematic analysis was conducted on the transcriptions from the interviews, using a deductive and inductive qualitative coding approach in MaxQDA. An initial coding framework was developed around the evaluation questions, with further codes added inductively as themes arose during the analysis process. Document variables were created based on the sampling criteria. The qualitative coding framework is included in Annex 11. Prior to analysis, the detailed notes of each interview were cleaned and prepared for analysis in MaxQDA. Once the coding process was completed, analysis of the coded segments was conducted to identify areas of convergence and divergence within the data.

Project data analysis

Project data was provided by Avanti and consortium partners. All the data went through an initial scan for relevance and utility. Data was considered relevant if it contained data relating to the evaluation questions, or useful background information. Basic descriptive statistical analysis of the monitoring data was undertaken in Microsoft Excel, with trends and changes over the life of the project identified. Qualitative data was based on the documents' contents and did not go through a formal coding process. The findings from the project data analysis fed into the qualitative tool design.

Specific note should be taken of the analysis of KCPE (Kenya Certificate of Primary Education) data. Average KCPE scores were submitted by 28 of the 32 iMlango schools sampled for the endline evaluation across all four counties (Makueni, Kajiado, Kilifi, and Uasin Gishu). The data included average scores for all five KCPE subjects (English, Kiswahili, Maths, Science, and Social Science and Religious Education (SSTR)), as well as average total scores from 2016 to 2020. The numbers of boys and girls taking the exam each year per school were also recorded (but no separate scores were available for each gender group, so there was no opportunity for disaggregation). Specifically, all 16 schools from Kilifi and Uasin Gishu (eight from each), and six each from the other two counties submitted data. This report only focuses on the analysis of literacy, numeracy and overall average scores. Based on the average scores and number of students from each school in each county, mean scores for English, maths and the cumulative score of all five KCPE subjects were calculated and analysed for each county.

Combining findings

After the monitoring data and primary data analysis was complete and findings identified, the findings were combined in a process of triangulation. Convergent findings and trends were identified and points of divergence identified and explored.

Challenges and limitations of the approach

While the endline methodology was appropriate and feasible to meet the evaluation purpose and the necessary ethical considerations, it is important to note the constraints and limitations of the approach. These were understood at the outset of the evaluation and discussed and agreed upon with both iMlango and the FM.

Firstly, the Covid-19 pandemic necessitated that endline data collection was conducted remotely, which has a number of associated challenges and limitations:

- Despite the support and coordination offered by the school teachers, remote data collection made recruiting participants more challenging and time-consuming than when done face-to-face during school visits.
- Remote data collection relies on the participants having access to technology to allow them to participate, as such there were challenges recruiting participants over the phone if they are using phones that do not belong to them. Enumerators reported difficulty with scheduling calls with participants, due to the availability of the caregivers or the contact person whose phones were being used.
- Remote data collection does not lend itself to certain qualitative data collection approaches and as such the evaluation was unable to include focus group discussions as planned, instead relying on semi-structured KIIs. This had the potential to limit the depth of insight through the qualitative interactions, however broad coverage through KIIs and thorough probing within interviews mitigated some of the potential loss.
- Remote data collection was also disrupted by poor connectivity. Enumerators reported that calls often dropped due to poor network and surveys and interviews had to be completed over a number of calls. Enumerators also liaised with schools to identify spots where call reception was stable and had students use the phone from that spot.
- Enumerators also reported that there were issues with the audibility of respondents talking on the phone, as it was not possible to control how respondents were holding the handset. As such, enerumators reported issues hearing some of the respondents, understanding their answers and difficulty taking notes. The enumerators encouraged schools to brief students on how to hold phones or set up handsfree, and in some cases replacement phones were used.
- The data collection team identified that some students in the first few schools were being coached by teachers in their responses. This understandably would have interfered with the authenticity of the data and introduced an unhelpful bias. As a result, the data collection team engaged the Avanti field officers to reiterate the need for independence to the school management. Interviews were rescheduled when headteachers assured the enumerators that teachers were clear on expectations. In

addition to this, older students were selected for interviews as this reduced the likelihood of teachers influencing their responses.

- Due to ethical considerations, remote data collection reduces the time available for each survey, meaning that the survey design is shorter, leaving less time to probe. As such, less data was collected than at the baseline evaluation point. However, enumerators reported that some of the qualitative tools were too long and that interviewees sometimes rushed answers, complained that there were too many questions and were tired or uninterested. This may have affected the quality of the data collected.
- Enumerators also had increased difficulty in establishing a personal connection and rapport with each participant over the phone. Because of the difficulty in building rapport with participants, particularly interviewees, and the limitations of data collection over the phone, there is the potential that the depth and richness of qualitative data collected is compromised, particularly with students.
- Enumerators reported challenges in finding the necessary participants for the qualitative data collection as outlined in the sampling criteria. As the enumerators could not visit schools to recruit students they were reliant on the support of headteachers and teachers to identify the students and facilitate contact with them. Additional schools had to be added to the qualitative sampling and additional interviews conducted in order to meet the sampling criteria.

Secondly, the revised approach introduced contribution analysis as the overarching analytical framework. This approach was agreed in conversation with the iMlango consortium and the FM and deemed appropriate for the broader context of the endline evaluation. Contribution analysis is a rigorous approach however in an ideal scenario it would be done in an iterative manner. This means that evidence should be repeatedly collected and analysed, and narratives gradually refined. Unfortunately, given the timeframe and budget restrictions of the endline evaluation, the iterative component of the approach was not implemented, in part limiting its strength. Time constraints and the availability of data also meant that the contribution analysis was unable to thoroughly address all aspects of the theory and change– specifically those aspects related to girls' literacy and numeracy outcomes. Whilst this key outcome was not ignored in the evaluation, constraints in collecting more learning data limited the depth of analysis that could be done.

Thirdly, whilst the contribution analysis incorporated a great deal of evidence from, and analysis of, primary data (surveys and interviews), there was less incorporation of data from secondary sources. In-depth searches for and analysis of other projects' interventions, policy documents, academic and grey literature were limited due to time and budget constraints.

Fourthly, the changing context of Covid-19 restrictions affected the endline evaluation. For example, due to travel restrictions for Jigsaw, it was not possible for Jigsaw staff to conduct a face-to-face training course for the enumerators. An alternative approach was developed, involving RDM and Avanti meeting in person and Jigsaw staff delivering the training remotely. Most significantly, the endline data collection had to adapt to the changing nature of school closures, with permission not being granted to access schools in person and all data collection

to be conducted remotely. There was also a limited time before school term closures and exams resulting in a small window for data collection with students.

Fifthly, some caution should be taken in interpreting the results of some of the statistical analyses due to the small sample sizes. Smaller effects, especially in disaggregated data, may have remained undetected because there were insufficient sample sizes in which to do so. As such, there is the chance that no statistical relationships were reported between variables, when indeed a small, though less detectable relationship, might have existed. Conversely, there is the risk that with small and less representative samples, that the statistically significant results that are found might be due to chance, or have a higher degree of associated error than might be the case with larger, more representative sample sizes. However, the nature of remote data collection, the Covid-19 context, data collection time restrictions and budget constraints meant that there was a limit on the number of key informant interviews that could be conducted; the decision was therefore made to focus on the small group of informants that would potentially give the most contextual insight.

Finally, a significant limitation of the endline evaluation is that it is not comparable with the baseline and midline evaluations due to the context within which it was conducted and the resulting constraints on data collection. The samples at endline are indicative and sampling had to be based on who was available and willing to participate in the research.

Annex 3: Learning Outcome Data Tables

[Not Applicable for this endline evaluation]

Annex 4: Characteristics and Barriers

Table X: Girls' characteristics

	Intervention			Comparison			Source (Household /Girls School survey variable name)
Sample breakdown (Girls)							
	Baseline	Midline	Endline	Baseline	Midline	Endline	
Orphans (%) - Single orphans - Double orphans			NA			NA	
Living without both parents (%)			NA			NA	
Living in female headed household (%)			25.3% (student self-report data)			NA	97/383 student survey data: HOH_gener

Married (%)			0% (student self-report data)			NA	0/382 student survey data: marriage
Mothers (%) **- Under 18** **- Under 16**			0% (student self-report data)			NA	0/382 student survey data: children
Poor households (%) **- Difficult to afford for girl to go to school** **- Household doesn't own land for themselves** **- Material of the roof (material to be defined by evaluator)** **- Household unable to meet basic needs** **- Gone to sleep hungry for many days in past year**			NA			NA	
Language difficulties: **- LoI different from mother tongue (%)** **- Girl doesn't speak LoI (%)**			NA			NA	
Parental education **- HoH has no education (%)** **- Primary caregiver has no education (%)**			7.6% (student self-report data) NA			NA	29/382 student survey data: HOH_education

Sample breakdown (Boys)							
Where data has been collected for boys, please provide the sample breakdown below using the same categories from above as far as possible.							

Table X: Potential barriers to learning and transition

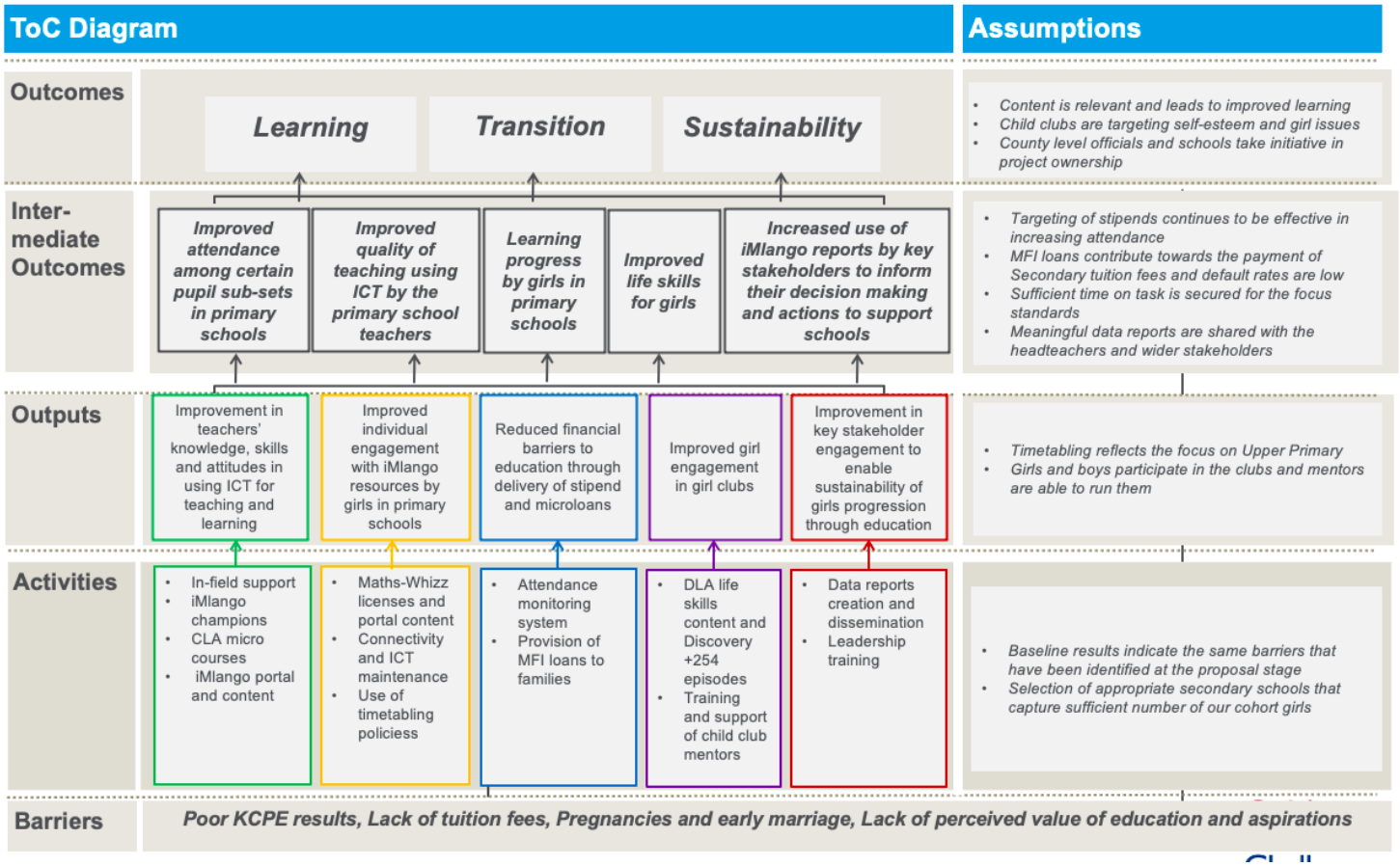
	Intervention	Comparison	Source (Household /Girls School survey variable name)
Sample breakdown (Girls)			
Home – community			
Safety:			
Fairly or very unsafe travel to schools in the area (%)	Baseline, Midline, Endline	Baseline, Midline, Endline	
Doesn't feel safe travelling to/from school (%)	NA	NA	
Sufficient time to study: High chore burden (evaluator to specify threshold, %)	1.8% (self-reported disruption to schooling because of chores)	NA	7/381 student survey data: chores_stop
Doesn't get support to stay in school and do well (%)	1% (self-reported data on whether they feel supported by their parents and teachers)	NA	2/383 for each student survey data: supportive_parents and supportive_teachers
School level			
Attendance:			
Attends school half the time (%)	97.3% (student self-report data on weekly attendance including those who do not miss school)	NA	369//379: student survey data: nonattendance
Attends school less than half time (%)	2.7% (student self-report data on weekly attendance)	NA	10/379: 9 missing 3 days weekly and 1 missing 5 days weekly; student survey data: nonattendance
Doesn't feel safe at school (%)	NA	NA	
No seats for all students (%)	NA	NA	
Difficult to move around school (%)	NA	NA	
Doesn't use drinking water facilities	NA	NA	

Doesn't use toilet at school	NA	NA	
Doesn't use areas where children play/ socialise	NA	NA	
Disagrees teachers make them feel welcome	0.5% (student self report)	NA	student survey data: teacher_welcome
Agrees teachers treat boys and girls differently in the classroom	1.6% (student self report)	NA	student survey data: equal_treatment
Agrees teachers often absent from class	15.9% (student self report)	NA	student survey data: teacher_absence

Annex 5: Logframe

[ATTACHED AS A SEPARATE DOCUMENT]

Annex 6: Theory of Change



Annex 7: Outcomes Spreadsheet

[Not Applicable for this endline evaluation]

Annex 8: Beneficiaries tables

[ATTACHED AS A SEPARATE DOCUMENT]

Annex 9: External Evaluator's Inception Report

[ATTACHED AS A SEPARATE DOCUMENT - TO BE INCLUDED IN FINAL VERSION

TWO DOCUMENTS WILL BE INCLUDED - THE ORIGINAL INCEPTION REPORT AND THE ADDENDUM TO THE INCEPTION REPORT FOLLOWING THE METHODOLOGICAL PIVOT]

Annex 10: Data collection tools used for Endline

Clean copies of the data collection tools used for endline:

- Student survey codebook (Excel file so provided separately)
- Student KII template
- Teacher KII template
- Headteacher KII template
- BoM member KII template
- MoE official KII template
- Project staff KII template

[ATTACHED AS A SEPARATE DOCUMENTS]

Annex 11: Datasets, codebooks and programs, and upload to the UK Data Archive

Clean and anonymised datasets will be provided as Excel files separate from the report:

- Student survey dataset
- Student KII dataset
- Teacher KII dataset
- Headteacher KII dataset
- BoM KII dataset
- MoE KII dataset
- List of project data sources analysed
    - Logframe
    - ToC,
    - KCPE results,
    - Budget documents,
    - Project reports,
    - Whizz Education Learning loss paper,
    - Whizz Education presentation to World Bank,
    - iMlango GEC-T Baseline report,
    - iMlango GEC-T Midpoint report.

The following codebooks will also be provided:

- Qualitative coding framework (excel version)

[ATTACHED AS A SEPARATE DOCUMENTS]

Annex 12: Learning test pilot and calibration

[Not Applicable for this endline evaluation]

Annex 13: Sampling Framework

[Content removed for the public version of the report]

Annex 14: External Evaluator declaration

Name of Project: iMlango GEC-T

Name of External Evaluator: Jigsaw Consult

Contact Information for External Evaluator: m.thomas@jigsawconsult.com

Names of all members of the evaluation team: Annette Zhao, Bethany Sikes, David Hollow, Jonathan D'Rozario, Matthew Thomas, Meaghan Brugha, Rebecca Daltry and Sam Ejibua

Matthew Thomas, on behalf of Jigsaw Consult (Name) certifies that the independent evaluation has been conducted in line with the Terms of Reference and other requirements received.

The following conditions apply to the data collection and analysis presented in the endline report:

- Quantitative survey data and qualitative interview data was collected independently by the EE and project monitoring data was provided by the project for analysis
- Was data analysis conducted independently by the EE and does it provide a fair and consistent representation of progress? YES
- Data quality assurance and verification mechanisms agreed in the terms of reference with the project have been soundly followed (Initials: _MT_)
- The recipient has not fundamentally altered or misrepresented the nature of the analysis originally provided by _Avanti/WhizzEducation/sQuid_(Company) (Initials: _MT_)
- All child protection protocols and guidance have been followed (initials: _MT_)
- Data has been anonymised, treated confidentially and stored safely, in line with the GEC data protection and ethics protocols (Initials: _MT_)

Matthew Thomas

(Name)

Jigsaw Consult

(Company)

15 June 2021

(Date)

Annex 15: Project management responses to endline evaluation

Project management response from Avanti, Communications, Whizz Education and Camara Education

On behalf of Avanti Communications, Whizz Education and Camara Education we are satisfied with the findings and recommendations from the Endline Evaluation.

We recognize all findings and recommendations to be accurate and clear. We will be taking these into account when designing future education projects.

We would like to place on record our thanks to the Fund Manager consortium, the Foreign, Commonwealth and Development Office, UK Aid and our downstream partners.

We would like to applaud Jigsaw on really understanding the project, its core values, challenges and recognizing its potential.

Project management response from sQuid

(forthcoming)

25th February 2022

Response to the revised iMlango Endline

This endline report contains many important findings, however we are unable to endorse it. We consider that the report does not accurately represent some key positive aspects of the programme, namely in relation to attendance monitoring, long-term sustainability, and the teaching and learning of literacy. Our view is that the recommendations fail to accurately reflect even the report writer's detailed findings. The result is that the report is flawed.

Publication of this report was delayed because significant errors in its compilation were identified by us. These have not been fully addressed in this delayed final version. In particular, in its summary and recommendations, the report fails to deal properly with two key activities and the potentially profound positive impact they had in the iMlango programme.

Firstly, iMlango used digital attendance monitoring as a new tool to help better understand how to deal with the challenge of managing regular attendance at school. A body of evidence was built up which shows that, if correctly implemented, digital attendance monitoring opens up new understanding and has the potential to improve the learner's experience at school, and to identify and better support those learners who begin to drift away from school (but who have not yet become truly 'out-of-school'). At scale, this low-cost technology could be a game-changer in sub Saharan Africa.

Secondly, iMlango set out to find a path to local sustainability by building a microfinance lending model to help parents in these communities. By improving their microbusinesses, the improved livelihoods that result give greater certainty that their children will continue to attend school full time. Importantly, microfinance creates an attractive commercial business model, enabling some of the income from the activity to support the in-school education initiatives. This creates a potential for enterprise to assist significantly in the drive toward addressing improved education in marginalised communities. We contend that this is one of the most significant outcomes of iMlango, with far-reaching implications.

For reasons which are unclear, this revised report still chooses not to explore in any meaningful way these two key facets of iMlango.

As fundamental as these omissions are, we feel that the biggest failure of the report is in not understanding the work of iMlango in driving literacy improvement. The report is inconsistent in its drawing of quantitative and qualitative observations, and whilst it correctly identifies the good progress in maths learning, it has failed to conclude and correctly highlight from the evidence available that significant progress in literacy was made. Poor analysis has no place in such an important document, leading as it does to flawed recommendations.

We encourage the reader to look at the detail of the findings of the report, and to engage with the iMlango partners who actually carried out the activities in the field. The body of data and experience gained over the 2014-2021 period of this programme provides enormous learning for all, going far beyond the limitations of this endline report.

Meaningful, objective research and assessment of programmes such as iMlango is vital if we are to learn lessons that might be applied to help address the enormous scale of improving learning outcomes in sub Saharan Africa. Such documents should not be allowed to be compromised for reasons of genuine mistakes (which can be addressed) or inappropriate motivations.