Project Evaluation Report

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Girls' Education Challenge

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Project Consortium

BASELINE REPORT

iMlango Transitions – GEC-T External Evaluation

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Cover sheet

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Abbreviations

APHRC	African Population and Health Research Centre
BoM	Board of Management
CA	Consortium Agreement
CFO	Chief Financial Officer
CIH	Community Internet Hub
CLA	Camara Learning Academy
CPP	Child Protection Policy
CSO	Curriculum Support Officer
DEO	District Education Officer
DFID	Department for International Development
DLA	Discovery Learning Alliance
EAs	Enumeration Areas
ECMP	Early Child Marriage Programme
EE	External Evaluator
EGMA	Early Grade Math Assessment
EGRA	Early Grade Reading Assessment
ERIC	Ethical Research Involving Children
ESG	Evaluation Steering Group
FGD	Focus Group Discussion
FGM	Female Genital Mutilation
FM	Fund Manager
GEC	Girls Education Challenge
GIS	Geographic Information System
HH	Household
HHS	Household Survey
ICT	Information and Communications Technology
KES	Kenyan Shilling
KICD	Kenya Institute of Curriculum Development
KII	Key Informant Interview
KNBS	Kenya National Bureau of Statistics
KPI	Key Performance Indicator
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MoE	Ministry of Education, Science and Technology
MSL	Maxwell Stamp Ltd. (Plc)
NMS	Network Management System
ODK	Open Data Kit
PPS	Probability-Proportional-to-Size
PTA	Parent-Teacher Association
RCT	Randomised Control Trial
RQDA	Routine Data Quality Assessments
SC	Steering Committee
SPSS	Statistical Package for the Social Sciences
ToC	Theory of Change
ToR	Terms of Reference
ToT	Training of Trainer
TSC	Teachers Service Commission
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VfM	Value for Money
VSAT	Very Small Aperture Terminal

Executive Summary

Background

Kenya has made significant gains in gender equality in education. For school-aged girls, especially those in marginalised areas, such gains could be eroded and/or remain a mirage because of contextual factors that at times reinforce each other. These factors include poor quality teaching and learning environments; household economic marginalization; and, entrenched social attitudes. To mitigate the effects of these factors on girls' education, the government of Kenya uses policy instruments with the key ones being (i) the Education for Sustainable Development (ESD) Policy, 2017 that domesticates SDG 4 and the education Agenda 2063 of the African Union; (ii) the Education Sector Gender Policy, 2015 that promotes the realisation of equal access to education of both boys and girls; and, (iii) the Sector Policy for Learners and Trainees with Disabilities, 2018 that demonstrates the government's commitment to the full realization of education as a basic human right for all Kenyans as re-affirmed in Constitution of Kenya (2010).

The duration of the iMlango Transitions project is 4 years – from 2017 to 2021. The direct beneficiaries are school girls estimated to be 70,000 spread in about 205 schools. The indirect beneficiaries are approximately 70,000 boys, new school entrants estimated at 17,500 every year – all in iMlango schools; about 12,000 per annum non-iMlango boys and girls in target secondary schools, an estimated 135,000 learners that will be reached through spill over effects at any one single time, 4,000 teachers and over 10,000 parents, among others.

The project's theory of change is premised on the individual and interactive effects of (i) teaching and learning interventions; and, (ii) interventions designed to challenge the gendered expectations which act to limit the academic performance, aspirations and progression of girls especially those in difficult circumstances. It is assumed that once these interventions are implemented, the projects three ultimate outcomes of learning, transition and sustainability will be achieved through five intermediate outcomes which are improved attendance, improved quality of teaching using educational technology, learning progress by girls in primary schools, improved life-skills for girls, and uptake of iMlango lessons learnt and findings by stakeholders.

The baseline evaluation approach is quasi-experimental involving two intervention groups and a control group. These groups were selected and assigned to treatment and/or control group during iMlango-1 project that ended in 2017. Data was collected through a mixed-methods approach that involved assessment tools, surveys as well as classroom and laboratory observations. To enrich the quantitative analysis, qualitative data was collected from key stakeholders. The data was collected at school level from 3,964 girls for learning outcome assessment in primary school Grades 2, 6 and 7 spread across 118 schools; and from a subset of 2,129 girls for the transition outcome assessment. In each school 33 girls were selected for the learning cohort while 22 out of the 33 were selected for the transition cohort. Additionally, a selected number of benchmarking cohort of 160 girls in primary Grades 3, 4, 8 and secondary Grade 1 as well as 206 households were involved.

Baseline findings

In literacy, mean baseline scores ranged from 25% for Grade 2 to 58% for Grade 7. The difference between treatment and control groups was minimal and statistically insignificant for Grades 6 and 7. For Grade 2, the difference was small (1.51%) but statistically significant (α=0.05). Overall, in literacy, the intervention group had a mean of 45.4%, only 0.67% (insignificant) below the control group. Based on these literacy assessments mean scores, there was a baseline balance between the two groups. On numeracy, the mean scores were slightly higher for all grades and groups compared to literacy scores, ranging from 28% to 63%. The difference between the intervention and control groups was small (below 1.2%) and insignificant.

Overall, in numeracy, the intervention group had a mean score of 49.9% which was 1.01% (insignificant) above the control group – an indication of baseline balance.

Learning skill gaps in numeracy were mainly observed in the areas of subtraction (11%), algebra (59.6%), and data interpretation (88%). In literacy, the skill gaps were observed in comprehension combined with inferential (15.9%), comprehension alone (26.9%) and in short essay writing (40.4%). At baseline, some characteristics were found to have the potential of inhibiting their progress. Although by only a handful of girls, these included physical safety especially while travelling to school, concerns with drinking water facilities, inadequate seating spaces and inadequate teacher support.

The intervention group in-school progression rate was lowest for the 16-17 year olds (66.7%, n=48) compared to 60.9% for the control group (n=23); and highest (77.8%) for the 18-19 year olds though the sample was very small (n=9). The control group had only 2 girls for this 18-19 age group, and 1 of them had transitioned successfully. For the youngest age group among the intervention girls, 6-8 years, in-school progression was at 74% (n=285), compared to 54% for the control group (n=124) which is a huge difference.

At baseline, the girls characteristics found to have the potential (measured by the proportion of parents/households that reported the incident) of inhibiting their progress include: (i) Orphanhood, with 34.1% of parents in the intervention group and 28% of parents in the control group reporting paternal orphanhood; (ii) Given the decision making structures and patterns of property ownership that favours males, living in female headed household was reported as a barrier by 28.2% of households in the intervention group and 30.1% of households in the control; (iii) Poverty was also reported as a barrier experienced by individual girls and this was proxied by 'affordability to send a girl to school' with 49.9% of parents in the intervention schools and 52.5% in the control schools report having difficulties in sending the girl to school. Respondents in Key Informant Interviews (KII) and Focus Group Discussions (FGDs) gave several responses regarding their planned actions to ensure project sustainability such as charging a minimal amount for the community people to access the ICT equipment; engaging the county governments; enforcing the ICT integration policy; including other subjects apart from Maths and English and ensuring all girls are in school by using the '*nyumba kumi'* (ten households) initiative.

The most striking pattern under the marginalisation analysis was that the subgroup of girls who scored the lowest in literacy were the same subgroups that scored the lowest in numeracy. The marginalised subgroups were the girls with (i) mother tongue different to the language of instruction (LoI) (n=65) with mean of 31.5% and 36.0% for literacy and numeracy, respectively; (ii) self-care impairment (n=57) with means of 34.9% and 39.7% for literacy and numeracy; and, (iii) communication impairment (n=74) with means of 37.6% and 40.1%. The mean scores of most of the other marginalised subgroups were in the range of 40%-50%, which compares relatively well with the overall mean scores for all girls. On gender issues, girls felt that teachers provided equal learning opportunities to boys and girls. Familieies of the girlswho received stipends felt that they now had an opportunity to relieve girls from the burden of household chores; while the community is increasingly becoming aware of the disadvantage experienced by girls due to early marriages, pregnancies or poor school attendance. This perhaps could explain why the attendance rates for girls were similar to that of boys – at 91%.

Our spot check data showed an almost perfect balance in attendance between intervention schools (at 91%) and controls schools at 91.2% - with no much difference in attendance rate between boys and girls. However, on disaggregating data by grades, girls in grade 5 had the lowest attendance (84.7%) compared to S5 boys at 88.7%, which was also the lowest for boys.

Over half of the girls in the intervention (56.9%) and control (59.7%) group reported that teachers often used different language (other than English) to help them understand lesson content. On the other hand, about one in every four girls in the intervention (76.3%) and control (76.0%) reported that teachers often

encouraged students to participate during lessons for instance by answering questions. . Key indepth interviews conducted with local community leaders (i.e. chiefs and Minsitry of Education officials) revealed that all these leaders were conversant with iMlango project activities and expressed interest to continue support it in areas such as (i) sensitization of the communities during the chiefs' *barazas*, (ii) ensuring all girls are in school by using the '*nyumba kumi'* initiative, and, (iii) involving local political leaders and lobbying to have ICT in every school. Regarding girls, most local community leaders felt that inadequate learning by girls is mainly caused by parents giving chores to the girls and an 'un-written rule' that require girls to be home earlier than boys.

1. Background to project

1.1 Project context

1.1.1 Main contextual factors that have influenced the project design or delivery

Although there have been significant shifts regarding gender and education in Kenya in recent years, challenges remain for school-aged girls in particular those from specific marginalised and socially excluded groups. The situation of girls who are educationally marginalised in Kenya tends to be directly related to their families' broader socio-economic marginalisation - harmful gender norms and gendered expectations intersect with some of the economic realities of family life. For example, in many communities, more value is put on the education of boys because girls marry early for dowry and then leave the family home. Girls are also more likely to be asked to contribute to household labour and chores, and thus are less likely to attend school regularly. At the same time, particularly in parts of rural Kenya, the most marginalised students, who often require the most support, tend to fare the worst in terms of learning outcomes and educational attainment as a result of the poor-quality teaching and learning environments they experience.

The table below shows the Primary School Enrolment, Completion and Transition Rates by County and Gender. It shows poor completion rates for girls in the four counties being supported by iMlango and very poor transition rates especially for Kilifi, Kajiado and Makueni.

Table 1-1: Education related indicators per County[1]

County	Education Indicator	Boys	Girls
Kilifi	Net Enrolment	76%	72%
	Net Completion	72%	42%
	Transition	18%	21%
Kajiado	Net Enrolment	68%	65%
	Net Completion	56%	46%
	Transition	36%	28%
Makueni	Net Enrolment	98%	96%
	Net Completion	-	-
	Transition	22%	21%
Uasin Gishu	Net Enrolment	96%	96%
	Net Completion	64%	64%
	Transition	39%	42%

Literature on girl's education in Kenya summarises the main barriers to girls' education to include: inadequate sanitary facilities that make it difficult for girls to manage menstruation, household poverty that increases opportunity cost for girls, physical distance to school that presents safety concerns, and social norms that includes child marriage and female genital mutilation/cutting among others (Webster, 2005[2]).

[1] Adapted from Education Policy and Data Center (2007).

[2] Webster, K.L. (2005). Sociocultural Barriers to the Education of Kenyan Girls: Gender Stereotyping and Sexual Violence in Secondary Schools, Engendering Human Rights, pp. 179-201.

1.1.2 How gender inequalities and marginalisation impact on the education of girls

Gender equality in education means that girls and boys have equal conditions for realizing their full rights facilitating their contributing to and benefiting from education interventions and/or programmes. It implies that similarities and differences between girls and boys and their respective roles are recognized and valued equally. The impact of gender inequality is dependent on how gendered barriers correlate with other forms of discrimination and disadvantages that girls and boys face within the education system. Thus, a gender equality strategy must recognize and respond to the needs and interest of girls and boys.

UNICEF estimates that as of 2012, 83.2% of youth (ages 15–24) in Kenya, are literate[3]. In 1973, the girls made up only 43% of total primary school enrolment. In the educationally advanced districts, this proportion was close to 50%, while in the districts in the pastoral areas and coast province –including the areas targeted by the iMlango Project, it was below 32%. According to UNICEF, the relationship between male and female enrolment widens in secondary education with 51.6% of enrolled students being male and 48.4% being female. UNICEF reports that the greatest gender disparity exists among the poorest quintile group of Kenya, with attendance rates being 33.1% and 25% for males and females respectively. What is very clear is that there is a distinct difference in rates of enrolment for females in certain districts, with the highest district, Kirinyaga enrolling 51.8% of its girls in school and the lowest district, Wajir, only enrolling 13.9% of its girls (Chege, et. al., 2014)[4].

While releasing the Kenya Certificate of Primary Education (KCPE) results in 2017, the then Minister for Education in Kenya, Dr. Fred Matiangi announced that Kenya has almost achieved total gender parity in education and aims to achieve a 100 percent transition from primary to secondary school by providing free education. He said that of the total 993,718 candidates who sat the 2017 KCPE examination, 498,775 (50.19%) were boys and 494,943 (49.81%) girls. Twenty-seven (27) registered more female than male KCPE candidates as opposed to 23 in the 2016. Of the four counties targeted by iMlango Project, only, Makueni is in the list among the 27 counties.

The Kenya National Gender Policy in Education, 2015 is anchored on the principles of equal access to education, equal rights, opportunities and responsibilities, protection from all forms of discrimination, respect for cultural diversity and equal participation, equity of education systems, inclusion of all irrespective of age, sex, disability, creed and culture, and empowerment of girls and boys to achieve gender equality in education. However, harmful cultural practices e.g. child marriage and FGM, distance to school that exposes girls to various forms of gender-based violence, lack of gender responsive mentorship and role modelling for all learners, as well as school environment and management that is not gender responsive remains a great challenge for the education sector in Kenya.

Notably, marginalization may lead to inequalities between girls and boys that may impact negatively on girls' education. For instance, in iMlango project sites such as Kajiado, distances to school within these Arid and Semi-Arid Lands, limits access to education especially for girls. Girls are more sensitive to distance due to safety concerns as well as the effects of stress and exhaustion from pre-school time household

[3] https://www.unicef.org/infobycountry/kenya_statistics.html

[4] Chege, Sifuna, Fatuma, Daniel N. "Girls and Women's Education in Kenya: Gender Perspectives and Trends" (PDF). UNESCO. UNESCO. 2014.

chores (Alderman & King, 1998[5]; Amadi, 2011[6]; Vuri, 2007[7]). This may be in addition to lack of basic infrastructural facilities such as water and toilets and needs such as sanitary towels for adolescent girls. Besides, risks associated with long distances to school may lead to delayed enrolment in school, low attendance rates, low retention, progression, transition and frequent cases of absenteeism as well as poor participation of learners in the classroom activities.

1.1.3 Education policy context

i. Education for Sustainable Development (ESD) Policy, 2017

Education is an essential tool for achieving sustainability. Education for Sustainable Development (ESD) allows every person to acquire the knowledge, skills, attitudes and values that are necessary to shape a sustainable future and requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and enhance competencies for sustainable development. This ESD Policy provides for the incorporation of key themes of sustainable development such as poverty alleviation, human rights, innovation, health and environmental protection and climate change into the Kenyan education system. It promotes competencies such as critical thinking, creativity and making decisions in a collaborative way. Through Sustainable Development Goal 4 (SDG4), ESD provides a cross cutting mechanism for the achievement of all the SDGs in Kenya. This is in line with Agenda 2063 of the African Union, which calls for action on catalysing education and a skills revolution to build knowledge, human capital, capabilities and skills to drive innovations on the continent.

The Government of Kenya is committed to promoting ESD as a key element of enabling sustainable development and delivery of quality education. Based on Kenya's performance in the last ESD Decade, the overall objective of this policy is to reorient education and learning so that everyone can acquire the knowledge, skills, values and attitudes necessary for contributing to sustainable development. This will be realized through integrating sustainable development into education and integrating education into sustainable development. The Ministry has prioritized to focus on emerging gaps in the sector. These include, advancing ESD policy, transforming teaching, learning and training environments, building capacities of educators and trainers and accelerating youth empowerment and ESD solutions at local level. This is in line with aspirations of Kenya's Vision 2030, the Global Action Programme (GAP) on ESD and SDGs.

ii. Education Sector Gender Policy, 2015

Since independence Kenya has been pursuing policies towards the realisation of equal access to education of both boys and girls as demonstrated by being signatory to International Conventions and Agreements on human rights and gender equality. The Government has put in place several interventions such as introduction of Free Primary Education (FPE) in 2003, Free Day Secondary Education (FDSE) in 2008, Low Cost Boarding Schools and Mobile Schools in Arid and Semi-Arid Lands (ASALs), a policy on re-entry for girls who drop out of school as a result of pregnancy, affirmative action in the allocation of bursaries, and admission of girls in universities. All these interventions have led to greater equality in representation of

[5] Alderman, H. & King, E. (1998). Gender differences in parental investment in education. Structural Change and Economic Dynamics, 9(4), pp. 453.468.
[6] Vuri, D. (2007). The effect of availability and distance from school on children's time allocation in Ghana and Guatemala. Working Paper, Understanding Children's Work (UCW) Project University of Rome. Accessed from http://www.ucw-project.org/attachment/standard_school_distance_vuri20110224_151422.pdf
[7] Amadi, M.N. (2011). Access and Success: The Role of Distance Education in Girl-Child Education in Nigeria. US-China Education Review, A7, pp. 986-993.

women and increased opportunities for boys and girls in schools and colleges. However, despite these interventions, the Government is still faced with challenges of addressing aspects of gender equality issues in the Education Sector, hence the need for a clear and comprehensive policy framework to guide the sector towards the achievement of equality. These challenges include: girl dropout rates as a result of teenage pregnancies, early marriages, and negative socio-cultural attitudes. There is the observation that supports the notion that women's empowerment is disparate across counties and ethnic groups and this undermines many programmes aimed at integrating the principle of gender inclusion in development agendas and policy dialogues. To ensure that girls in Kenya reach their potential, it is critical to address issues that relate to sexual and reproductive health. Through Education Sector Gender Policy, the Ministry has re-affirmed its commitment and determination to address legal and policy concerns in order to reduce gender equality gaps in the education of girls and women, boys and men.

Education is a fundamental human right and is key to individual, social and national development. It offers the opportunity to realise the attainment of human rights and is an important vehicle for addressing inequality and marginalisation. The Education Sector Gender Policy is geared towards a human rights-based approach, ensuring equal rights to education for boys and girls, men and women. The Ministry of Education, Science and Technology (MoEST) has undertaken the review of the Gender in Education Policy (2007), to incorporate emerging issues that have implications on gender equity and equality in the Education Sector. Within the constitutional and legal framework provisions, the gender policy advocates for more equal participation between women and men, girls and boys; and acknowledges that gender equality does not mean that women and girls are the same as men and boys, and vice versa, but that gender should not be used to determine access to education and educational outcomes.

iii. Sector Policy for Learners and Trainees with Disabilities, 2018

Global statistics indicate that approximately four out of five persons living with disability are in developing countries. Of these, 93 million are children under the age of 14 living with moderate or severe disability[8] . The Global Monitoring Report 2010 stated that an estimated 77 million children were excluded from education, a third were children with disabilities[9]. In May 2018, the Cabinet Secretary of the Ministry of Education launched the Sector Policy for Learners and Trainees with Disabilities, 2018. The Policy highlights the Government of Kenya's commitment to the full realization of education as a basic human right for all Kenyans as re-affirmed in the Constitution (2010). Article 54 (b) gives specific right to Persons with Disabilities to access educational institutions and facilities that are integrated into society and are compatible with the interests of the person. The commitment demands a system of education that guarantees this right. It therefore implies that the education and training sector should allow all learners to transit from one level to the other. The government, therefore, intends to ensure that learners with disabilities are enabled to transit from Early Childhood Development (ECD) to primary secondary, tertiary and university levels.

The policy aligns the provision of education and training to the Constitution of Kenya 2010, the Basic Education Act (2013), as well as the Sustainable Development Goal No. 4 on Equitable, Inclusive Quality Education and lifelong learning for all. In this regard, the policy framework recognizes the importance of inclusive education by emphasizing on the need for all learners to learn together in an inclusive

[8] UNESCO, 2015. Written Contribution to the General Discussion on the Right to Education for Persons with Disabilities on the occasion of the 13th session of the CRPD, 15 April 2015
https://www.ohchr.org/Documents/HRBodies/CRPD/DGD/2015/UNESCO.doc
[9] National Gender and Equality Commission, Access to Basic Education by Children with Disability, 2016

environment. This will be achieved through purposive cooperation and collaboration of all stakeholders in the education and training sector. The development partners, civil society, the private sector, communities and parents will partner and support the government in realizing the objectives of this policy.

In Kenya special needs education is provided in special schools, integrated units and in inclusive settings in regular schools. The Ministry of Education reported that in 1999 only 22,000 learners with special needs enrolled in schools with the number increasing to 26, 885 in 2003 and 45,000 in 2008[10]. According to the Basic Education Statistical Booklet, 2014, the number of special needs children enrolled in primary school had increased to 243,081, which is 2.9% of all those enrolled in primary schools. The number enrolled in secondary schools was 12,694, representing only 0.2% of all those enrolled in public secondary schools in Kenya. The much lower proportion in secondary schools indicate a lower transition rate for the special needs learners from primary to secondary school.

In the months of April and May 2015, the National Gender and Equality Commission conducted an assessment to find out the extent to which children with disabilities were accessing Free Primary Education. The assessment found no discrimination in various government policies to guide special needs education. The government provides education for children with disabilities through integrated units in primary schools. However, lack of a clear implementation framework of the Special Needs Education policy, inadequate funding, and inadequate number of teachers with the right skills to teach children with disabilities, hamper access to education by children with disabilities. This is coupled with negative attitudes, poverty, limited awareness by parents, insecurity and unsuitable institutions. Findings from all the six counties sampled showed that they do not maintain data on the number of children with disabilities in the ECD centres. According to the chiefs, majority of children with disabilities were not in school. County development officers had no records of children with disabilities. Head teachers reported they were aware of other children with disabilities in their catchment areas who had not been enrolled in school. Parents also acknowledged the presence of children who stayed at home especially those with severe disability (National Gender and Equality Commission, 2015).

According the Basic Education Statistical Booklet, 2014, the proportion of Special Needs Learners enrolled in public primary schools is about 3% of the total 9,950,700 (parity index girls/boys: 0.97). In the absence of national and regional disability prevalence rate, 3% can be taken as a proxy. Through this evaluation, the iMlango Project sought to better understand the prevalence of sub-groups of its beneficiary groups, including girls and boys with disabilities and the Project's impact on them.

1.2 Project Theory of Change and assumptions

1.2.1 Project's Theory of Change

The iMlango Project ToC seeks to support improvements to girls' learning by providing a) teaching and learning interventions focussed on the immediate need for higher quality teaching, and better learning content, alongside b) 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[11]). The ToC is underpinned by the project's commitment to using educational technology to drive change in schools. The Project's Theory of Change is shown in Figure 1-.

According to the ToC, higher quality teaching is achieved by ensuring effective use of ICT by teachers for the whole class learning[12], personalised learning by students in the lab; and capacity building, training and support for the teachers to enhance their teaching skills overall. Capacity building for the teachers is

[10] Ministry of Education, 2008.
[11] A small percentage of boys with poor attendance are included in the stipend support initiative.
[12] A detail explanation of how the project addresses poor quality of teaching, teaching absentiesm and limitations in teaching skills can be found in the annex 13

provided through learning experts, in-field support and refresher trainings. To facilitate quality teaching, the project provides specific content through the iMlango portal; KICD approved Longhorn literacy content, Maths-Whizz Teacher Resource for the teachers and individualised access to the Maths-Whizz Tutor for students, as well as digital micro-courses for teachers to assist in their capacity building. In addition, iMlango Champion teachers in each school are identified and trained to provide in-school program support and mentorship for the other teachers. The project also addresses issues with gendered expectations through life-skills training for girls in the girls' clubs which are run by trained mentors from the schools. The content used in these girls' clubs is provided by DLA. The project is also designing an intervention to support girls that have dropped out due to poor performance with the aim of bringing them up to speed and encouraging them to return to school.

The Project's TOC has three Outcomes: Learning, Transition and Sustainability and 5 Intermediate Outcomes: Improved attendance; Improved quality of teaching using ICT; Learning progress by girls in primary schools; Improved life-skills for girls; and Improved use of iMlango reports by stakeholders.

1.2.2 Barriers to girls' education and assumptions informing the theory of change

The barriers to education facing the project's beneficiaries are multifaceted and complex largely because of this intersection of a number of factors. The main barriers identified through iMlango's work in GEC-1 are:

Poor quality teaching and learning environments
Despite recent achievements, Kenya's education sector has faced challenges of governance, management and administration leading to gaps in service delivery and a gradual reduction in the quality of education on offer to the majority of students. The poor quality of teaching - indicated by teacher absenteeism, limitations in teaching skills and deficiencies in subject expertise - was cited as a salient factor in reaching learning outcomes in iMlango's endline evaluation for GEC-1. A small sample from the project revealed that most teachers had a "Maths age of between 7 and 10"[13]. There is also a continued demand for high quality learning content in Kenyan schools, with students frequently missing books and learning material to support their learning. iMlango's learning data shows students within iMlango schools typically lag behind by four years in Maths compared to both international standards and the performance of their Kenyan counterparts who benefit from higher quality education[14]. Class sizes are so large that teachers are often faced with the insurmountable task of following-up with absentees on an individual basis, despite automated provision of accurate, digital daily attendance reports.

Household economic marginalization
Whilst there is significant variation in household income levels across the project – even within counties – rural areas see more widespread, and worse, poverty levels than urban areas on the whole[15]. Kilifi County is one of the poorest of 47 counties in Kenya and suffers one of the worst Gini coefficients (0.57). As a demonstration of massive inequality within the county itself, Magarini sub-county, in which the project has 14 schools, has 84.5% of its population living in poverty, for example[16].

iMlango's baseline data from GEC-1 identified that the reason cited most for girls' early dropout was the inability to pay school fees (28%) – a direct cost which increases as students' progress into the upper levels

[13] iMlango data from GEC1 (cited in GEC-T Proposal)
[14] iMlango data from GEC1 (cited in GEC-T proposal)
[15] "Kenya Poverty and Inequality Assessment: Volume 1: Synthesis Report", World Bank (2008), http://siteresources.worldbank.org/INTAFRREGTOPGENDER/Resources/PAKENYA.pdf
[16] Ibid.

of school. Direct fees paid to schools have been abolished, although other contributions (fees for boarding, uniforms, examinations, school development, etc.) are still required, a continued economic burden for the poorest families. Parents also have to pay for school supplies, transport services to and from school, and private extra-tuition.

Often the opportunity costs and direct costs of educating girls are interwoven, driven by a combination of these economic and socio-cultural factors. Girls represent the primary source of household assistance in many communities and are often confronted with the "double burden", which also impacts on a household's ability to cope without the labour girls provide (i.e. the opportunity cost)[17]. This has been reaffirmed by qualitative data collected by the project's external evaluator during GEC-1's endline. Although there is an evidence of a growing acceptance of the importance of investing equally in both girls' and boys' basic education across Kenya, underlying socio-cultural norms and economic considerations tend to drive family decisions around who attends school, and critically in the Kenyan context, for how long.

Entrenched social attitudes

iMlango's endline evaluation for GEC-1 details how norms surrounding gender roles and relations can negatively affect girls' education. While these norms are manifested in different ways across the country, there are commonalities in the way that they affect girls' educational progression. In Kajiado Central sub-county, where the Maasai is the dominant ethnic group, Female Genital Mutilation (FGM) is still prevalent as a cultural norm. It is thought that women who aren't cut, lack authority[18] – so there are "push" and "pull" factors at play, whereby social stigmatization and even ostracization can occur if circumcision is refused. Studies show that many girls quit school as soon as they undergo female genital mutilation (FGM). This is because those who go through the rite, sometimes as young as 12 or 13 years old, drop out of school to marry and start a family. The practice involves a ceremony to perform the cutting, followed by a month-long seclusion for the wounds to heal. Because of the harmful physical and psychological effects of the practice it prevents most girls who undergo it from finishing their education[19]. Early pregnancy and child marriage are two other issues that are relatively widespread throughout the project.

The problems are most acute in Kilifi, where 47.4% of females marry underage[20]. Despite the Kenyan laws and policies developed to protect the right to education, a culture of intolerance also pervades many communities, whereby early pregnancy often results in the end of formal education for the girl in question – as found, and reported against, repeatedly in past Termly Assessment and Quarterly Reports.

It is important to consider that schools do not exist in social isolation from their communities - gender inequality at home or in the community impacts on students and may be replicated or even intensified in schools. Teachers are also important individuals in young people's lives, and their behaviours and attitudes can be highly influential. Teachers perpetuating discriminatory views are common, particularly in rural Kenyan schools, and their attitudes towards female students can have an impact on how the girls viewed themselves and their potential[21]. While gender parity in access to schooling is widely promoted in Kenya, dynamics in the classroom do not necessarily promote a sense of equality between girls and boys.

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[17] Girls' and women's education in Kenya: gender perspectives and trends", F. Chege (2016), http://ir-library.ku.ac.ke/bitstream/handle/123456789/14009/Girl%27s%20and%20womens%27%20education%20in%20Kenya.pdf?sequence=1&isAllowed=y

[18] The challenge of eradicating FGM among Kenya's Maasai", Deutsche Welle (2016), http://www.dw.com/en/the-challenge-of-eradicating-fgm-among-kenyas-maasai/a-19029709

[19] Kimonge H., 2011. Impact of Female Genital Mutilation on education of girls with hearing impairment in Gucha County, Kenya.

[20] "Keeping Girls in School", Plan International (research conducted in 2012), https://plan-international.org/kenya/keeping-girls-school#

[21] Ibid

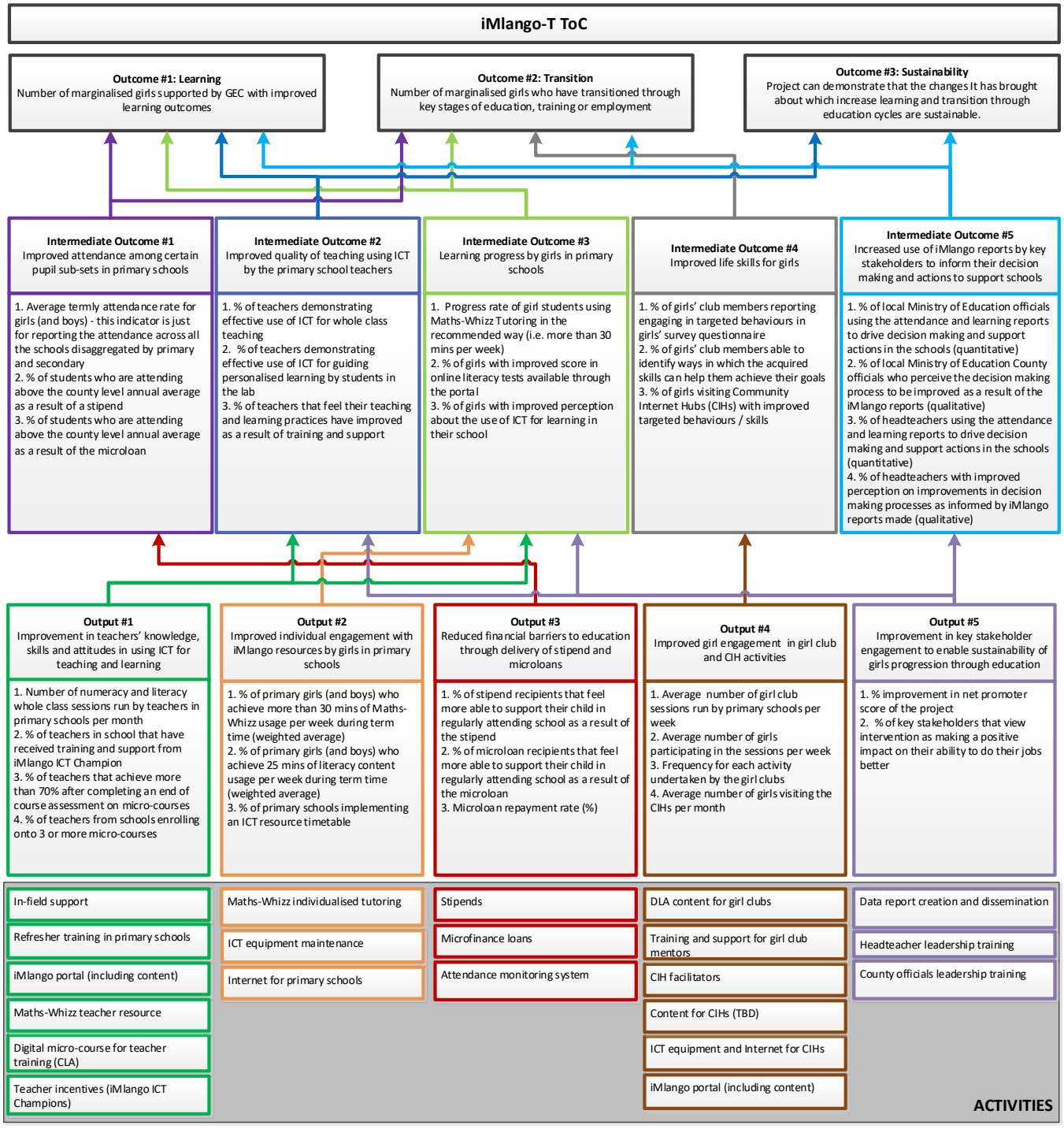


Figure 1-8: The Project's Theory of Change

1.2.3 Main activities of the project

The main activities are mapped onto 5 outputs: improvement in teachers' knowledge, skills and attitudes in use of ICT for teaching and learning; improved individual engagement with iMlango Resources by girls; reduced financial barriers to education by girls; improved girl engagement in girl clubs and CIH activities; and improvement in stakeholder engagement in to enable sustainability of girls' progression through education.

The main activities are:

- Delivery of content through the learning platform;
- Training of teachers to integrate ICT into their day-to-day teaching practices;
- In-field support for teachers;
- Refresher training;
- iMlango portal with teaching content;
- Maths-Whizz Teacher Resource;
- Digital micro-courses through the Camara Learning Academy (CLA) for teachers' training;
- iMlango champions to provide mentorship and project coordination at school level;
- Use of the attendance monitoring system;
- General field support and equipment maintenance;
- Financial support mechanisms (stipend[22], microfinance);
- Child club and Community Internet Hub guidance;
- Data dissemination to key stakeholders along with enhancing their capacity to interpret and use the data to perform their everyday tasks.

Table 1-2: Project design and intervention (project input)

Intervention types	What is the intervention?	What Intermediate Outcome will the intervention will contribute to and how?	How will the intervention contribute to achieving the learning, transition and sustainability outcomes?
Improvement in teachers' ICT capacity	• In-field support • Refresher training in primary schools • iMlango portal and content • CLA micro courses	Improvement in teachers' ICT knowledge, skills and attitudes leads to creation of better teaching and learning environment for the girls and the boys in the schools.	Building teacher competence in using ICT for teaching directly translates to improved learning environment and teaching practices which leads to learning outcomes for students.
Provision of learning content to students through the iMlango portal	• Maths-Whizz licenses and portal content • Connectivity and ICT maintenance • Use of timetabling policies	Girls learning progress is improved through their engagement with the content provided through the portal. More specifically, Maths-Whizz individualised tutoring helps each student learn in their own pace by addressing their specific learning needs.	Provisioning of dynamic education portal with Math tutoring and literacy content contribute towards improved students' learning outcomes and helps them perform better at the KCPE exams to enable them to transition to secondary school.
Provision of the financial support (stipend and MFI)	• Attendance monitoring system • Stipends to primary students with poor attendance (activity was completed in August 2018)	Reduced financial barriers for the economically marginalised girls leads to improved attendance	Financial barriers prevent economically marginalised girls from attending school. Overcoming the barrier through the provision of financial aids (MFI) contributes

[22] Stipends are being discontinued in favour of loans

Intervention types	What is the intervention?	What Intermediate Outcome will the intervention will contribute to and how?	How will the intervention contribute to achieving the learning, transition and sustainability outcomes?
	• Provision of MFI loans to families		towards increased school attendance that is positively correlated with improved learning performance.
Improvement in the girls life skills	• DLA life skills content and Discovery +254 episodes • Training and support of child club mentors	Girls improve their life skills that lead to higher self-esteem and confidence.	Content and activities in the school clubs and CIHs help girls to improve life skills, self-esteem and confidence that directly relate to making better life choices.
Engagement with key project stakeholders	• Leadership training • Data reports creation and dissemination	Stakeholder engagement to ensure of sustainability of girls progression through education.	Provision of project data reports and interactions with the headteachers and County officials lead to improved decision making process and school governance resulting in improved sustainability of the girls' progression through the levels of education.
Engagement with out-of-school (OOS) girls	This activity is not yet fully defined but we are considering a number of small targeted interventions that will address the immediate learning needs of girls that have dropped out of school.	This will contribute to OOS girls transition either towards completing primary schools, attending secondary school or equipping them with necessary skills for their lives.	We expect that some of the girls will go back to school to progress through the formal education pathway and receive the expected learning gains, but even for those that this option is not possible the skills that they will gain will improve their livelihoods.

Project's contribution

At this point we should note that the project has planned and started introducing fundamental changes to its approach towards the improvement of teachers' capacity to use ICT for teaching after feedback from the FM monitoring but also internal reflection. The current approach is focused on improving teachers' teaching abilities with a more holistic methodology and with appropriate tools to monitor progress.

1. *General Adaptations*

   - We will continue building the capacity of field officers and regional coordinators to work more closely with local TSC and MoE to monitor progress of the literacy and numeracy interventions in terms of pupils' progress, teacher capacity and community/parental involvement. We need to revisit the structure and functions of the Headteacher in supporting our literacy and numeracy interventions, while remaining sensitive to current responsibilities and workload.
   - A lesson observation tool is created, enabling project staff to provide simple, effective feedback to teachers in areas of gender responsive pedagogy, whole class lesson delivery using ICT and classroom management. Education advisors will provide subject-specific feedback within the same tool to assess and develop subject knowledge and technical teaching skills.

2. *Adaptations in our approach to literacy*

- Make changes on the portal content: organization, story arrangement and classification. On the content aspect we will create a teacher resource section where we can deposit teacher training handbooks, training videos, a teacher observation and feedback tool, sample lesson guides and scope and sequence of stories to be used by teachers for whole class teaching and individual teacher-guided lab sessions (weekly).
- Starting January 2019, we intend to further strengthen the capacity of focal teachers to better train and support their peers during literacy lesson delivery. We will form and operationalise teacher peer-support groups to include both lower and upper grade teachers, as well as the Headteacher and deputy Head to support each other in lesson preparation and delivery and monitoring of student progress. We will also build on our cascading model.
- We intend to focus more on measuring learning outcomes in all the components of literacy fundamentals, using the EGRA stimulus in schools. This will help us measure the progress of the pupils in the key areas of literacy. We are developing a process that will track pupils' progress over time, with triangulation capabilities between other sets of data (quant. and qual.). Similarly, we are adding a home reading task to every pupils' homework to ensure parental involvement in early grade reading activities with a home reading tracker.

3. Adaptations in our approach to numeracy

In addition to the continuation and enhancement of teacher training and support activities, (observations, workshops, 1:1 feedback, webinars, modelling best-practice), we will also:

- Implement a phased approach to building the capacity of field officers, gradually developing their skillsets through a reflective process of professional development so that they can begin to offer additional elements of support to teachers in iMlango schools.

1.3 Target beneficiary groups and beneficiary numbers

Box 1: Project's contribution[23]

iMlango-T is a technology-driven project working at 4 levels: the individual (pupil), the school, the community, and the system. The project encapsulates 205 primary schools, and a further 40 secondary schools with surrounding communities. The project runs in four counties in Kenya; Kilifi, Makueni, Uasin Gishu and Kajiado.

Kilifi is the only Muslim-majority county within the programme; Kajiado, Makueni and Uasin Gishu are all predominantly Christian, although tribal differences are marked. The main languages spoken among the population in the four intervention counties are English and Kiswahili, in addition several other local languages are spoken across the regions. English is the language of instruction in all the counties.

The 205 schools map onto 151 "sub-locations", each of which is headed by a local chief. The majority of iMlango schools are located in rural settings, with some schools situated in peri-urban and town settings. Seasonal agriculture is what large proportions of most communities are dependent upon for income, and erratic weather patterns (namely a prolonged drought, particularly in the coastal regions) over the last 2 years have exacerbated the precocity of many households' income streams. Economic marginalisation is therefore prominent amongst pupils (and their households). Across the four counties covered by iMlango, there is regional variation, with Kilifi possessing the highest incidences of poverty (67%), and Kajiado the lowest (12%). For example, Kilifi County has a poverty rate of 67% (>$1.25 a day) as last recorded by the Kenya National Bureau of Statistics (2006).
iMlango is the whole school programme aiming to improve student's educational outcomes throughout all grades in the primary schools. This should ultimately result in improved KCPE score at the end of primary school to enable successful transition to secondary schools. Therefore, the beneficiaries range from S1 to S8 in primary schools and F1 in secondary schools.

Direct beneficiaries are all girls within the project:

- Primary school: ~70,000 currently enrolled.
- Secondary school: ~800 per year (up to Form 2); will come from existing beneficiaries in the primaries[24].
- Out of school girls (and boys potentially) via relevant intervention that is currently being designed, focusing on enabling girls to catch up on learning and return to primary schools to re-sit KCPE.

Indirect beneficiaries:

- Boys who are enrolled in an iMlango primary school: ~70,000 currently.
- New standard 1 girls and boys who enrolment: ~17,500 p.a.
- Non-iMlango primary girls and boys enrolled in iMlango secondary schools: ~12,000 p.a.
- All girls and boys who are in contact with the primary intervention, as learning beneficiaries: ~135,000 at any given time.
- ~12,000 in secondary schools (forms 1 & 2) out of which, ~800 per year (transitioning) are iMlango primary school girls.
- ~4,000 teachers.
- ~10,000 parents via stipends; ~2,500 parents via microloans.
- 115 merchants.

[23] Primary student data included in this section are based on the sQuid attendance monitoring system data and rounded. Exact numbers at Term 3 if the 2018 school year can be found in Annex 4.
[24] Project is expecting ~800 iMlango primary school girls to transition into iMlango secondary schools each year. Once registration is completed in Jan 2019, we will be able to report this number accurately.

- 205 primary school Boards of Management.
- ~350 local ministry officials.

Real-time attendance system has been implemented into all treatment primary and secondary schools and can give attendance rates for all students in the schools. Through this monitoring system the project is able to understand the total number of beneficiaries, both direct and indirect.

Table 1-3 to Table 1-5 below present a breakdown of direct and indirect beneficiaries per County, intervention group and standard.

Table 1-3: Breakdown of beneficiaries by County (project input)

County	Direct	Indirect	Grand Total
Kajiado	10,953	10,845	21,798
Kilifi	30,425	31,368	61,793
Makueni	10,915	11,625	22,540
Uasin Gishu	17,833	18,038	35,871
Grand Total	**70,126**	**71,876**	**142,002**

Table 1-4: Breakdown of beneficiaries by intervention group (project input)

Intervention	Direct	Indirect	Grand Total
Group A	21,267	21,726	42,993
Group B	23,161	23,149	46,310
Group C	25,698	27,001	52,699
Grand Total	**70,126**	**71,876**	**142,002**

Table 1-5: Breakdown of beneficiaries by Standard (project input)

Standard	Direct	Indirect	Grand Total
1	6,084	6,416	12,500
2	6,521	6,877	13,398
3	6,849	7,131	13,980
4	8,307	8,851	17,158
5	9,224	9,387	18,611
6	10,423	10,586	21,009
7	11,239	11,229	22,468
8	11,479	11,399	22,878
Grand Total	**70,126**	**71,876**	**142,002**

In consultation with Avanti and FM, the EE used these numbers to estimate and select the sample size for both girls and schools (clusters) levels. These numbers were adequate to select a sample that would enable the analysis to be adequately powered. This way, the analysis would be able to detect the effect of the treatment. The numbers also allow sub group analysis and therefore help to understand where the change is coming from.

The mean school size of the 16 schools that responded to the headteacher survey was 759 students. For the 205 schools, assuming this mean school size holds, beneficiaries (boys and girls) could be slightly over

155,000. This number slightly exceeds the project-estimated total number of beneficiaries of 142,002 (boys and girls). It is also possible to compare the numbers with official statistics from the government sources such as MoEST statistics at the county level.

Using the headteacher questionnaire, the baseline collected data on various attributes of the school and community as reported in Sections 3 and 4. By design, the evaluation collected data based on a sample from the target population and such data may not be equated to the one reported in Box 1. For example, 118 schools were involved in the evaluation, while in Box 1 state that 205 schools are targeted by the intervention. That said, it is possible the M&E data from the implementer to be compared with the one in Box 1, but it is difficult for the EE to assess if the proposed beneficiary numbers are reliable. However, the numbers should be compared with what will be collected through the M&E process. That said, the table below provides county-level data for proportion of beneficiaries based on the government data (total enrolment in primary schools). Overall, the project is reaching about 1 in every 5 students enrolled in primary schools across the four counties. From the 2014 Basic Education Statistical Booklet, the four counties had mean school sizes of 311 for Kajiado, 510 for Kilifi, 301 for Makueni, and 383 for Uasin Gishu[25]. For the 205 target schools, this translates to 83,769 (boys and girls) – slightly over the project estimated number of direct beneficiaries.

Table 1-6: Comparison of county enrolment with beneficiaries' statistics

County	Government data[26] (enrolment)	Beneficiaries data (205 school)	Proportion of beneficiaries
Kajiado	115,720	21,798	19%
Kilifi	268,420	61,793	23%
Makueni	269,367	22,540	8%
Uasin Gishu	167,392	35,871	21%
Total	820,899	142,002	17%

[25] MoEST (2015). 2014 Basic Education Statistical Booklet. MoEST, Nairobi.
[26] 2014 Education Statistics – published by MoEST

2. Baseline Evaluation Approach and Methodology

2.1 Key evaluation questions & role of the baseline

2.1.1 Project's Key Evaluation Questions

The key evaluation questions for iMlango-T are a mix of the GEC-T wide questions and more project specific ones:

1. **What impact did the project have on girls' learning in Maths and Literacy?**
   i. Did the additional provision of ICT labs and individualized tutoring lead to additional learning for girls and boys compared to just ICT assisted whole class teaching?
   ii. Insufficient time on task potentially prevented stronger learning outcomes was one of the core endline lessons learned. The project is planning to overcome this issue with a timetabling policy. If this policy is implemented by the school, does it lead to the intended learning outcomes?

Logic: The iMlango 1 endline report demonstrated that access to online learning tools is directly correlated to improved KCPE scores in a statistically significant way. The main hurdle to overcome, therefore, is maximising pupils' exposure to the learning platform. We've already implemented timetables in every school, and it is a project priority to now devise further strategies to ensure pupils get adequate access to the learning tools.

2. **What impact did the project have on girls' transition through education stages?**
   i. Will "graduation" from a CIH, through completion of the comprehensive course provided, result in girls attaining better jobs than if they didn't have access to a Hub?
   ii. Following receipt of a loan, will enhanced income generation – as a result of successful business development – translate into an increase in household spending on the child's education? What impact will this then have on that child's academic performance (attendance, numeracy and literacy improvement)?

Logic: Content and activities in the school clubs and CIHs help girls to improve life skills, self-esteem and confidence that directly translate to improved transition through the key stages of their education and leads to increased employability. Financial barriers prevent economically marginalised girls from progressing school. Overcoming the barrier through the provision of financial aids (stipend and MFI) contributes towards increased transition through the stages of the primary school education and leads to the enrolment into post primary institutions.

3. **How sustainable were the project activities funded by the GEC?**
   i. The CLA will provide targeted, constant support to teachers, paving the way for fewer refresher training sessions. Will this activity help move the direct teacher support to a more sustainable and equally effective model over the long term?

Logic: The training modules uniquely developed and delivered through the Camara Learning Academy should negate the need for frequent refresher training sessions, as iMlango-1 teachers can "top-up" their knowledge on an ad-hoc basis via the CLA and new teachers can be introduced to the iMlango activities and feel empowered to pursue the objectives of the project. The CLA will also include needs-driven modules to support ICT integration in teachers' daily activities.

4. **Was the project successfully designed and implemented? Was it good Value for Money (VfM)?**
   i. How does VfM change across the different intervention groups of the project that provide different ICT components (individualized learning vs. whole class learning)?

5. **What are the drivers of any differences in learning outcomes - attendance, learning and transition – between girls and boys?**
   i. How does learning outcomes, attendance and transition outcomes change across the different study groups of the project?

6. **How does life skills (and self-esteem) development support learning progression for marginalized girls and boys?**
   i How do life skills (and self-esteem) change across different sub-groups of interest in this study?
   ii Does improved life-skills (and self-esteem) equate to improved learning progression among girls?

7. **How do the attitudes of students, parents and teachers support or hinder girls' (and marginalized boys') learning progress?**
   i How do attitudes of key study participants (students, parents and teachers) towards girls' education change across time?

Overall, the evaluation questions attempt to improve our understanding on the extent to which the intervention improves learning outcomes and transitions l through the key stages of the education. The questions also allow us to examine the intervention activities and the barriers they were designed to overcome, as well as the extent to which the activities promote sustainability and success of the project. Additionally, the evaluation questions recognise the context within which the intervention happens as well as household characteristics that could interact with the intervention to influence the outcomes. Further, they provide an opportunity to explore and test the projects theory of change and assumptions underlying it. This evidence will be critical in engaging program staff and policy makers on intervention components that may require improvement and scale up, respectively.

2.1.2 Role of the baseline evaluation

The role of the baseline evaluation is to:

- Set a baseline for the measurement of a project's outcomes (Learning, Transition, Sustainability), the project's Intermediate Outcomes, and the project's Outputs;
- Suggest targets for Outcomes and Intermediate Outcomes for the Midline and Endline evaluations, and for Outputs at annual frequency;
- Provide a nuanced, evidence-based picture of the context in which the project operates;
- Describe the profile of the project's girl beneficiaries and boy beneficiaries (where applicable);
- Review the project's calculation of beneficiary numbers;
- To identify and assess the barriers to education that girls face, especially with regards to their learning, progression through formal and informal education, and transition across stages of education;
- Assess the validity of the project's theory of change, including testing its assumptions and how interventions are designed to overcome barriers and lead to outcomes;
- Investigate the linkages between Outputs, Intermediate Outcomes and Outcomes;
- Understand the project's approach to gender equality and how this has been integrated into the project design;
- Assess the gender gap in learning and transition (where boys' data has been collected);
- Provide the GEC Fund Manager, DFID, and external stakeholders quality analysis and data for aggregation and re-analysis at portfolio level.

The ultimate uses of the evidence and analysis in the baseline evaluation report will be to:

- Reflect on and assess the validity and relevance of the project's Theory of Change
- Evidence why changes may need to be made to the project's activities in response to the analysis
- Review the project's Logframe Indicators and change them where appropriate

2.2 Outcomes and Intermediate Outcomes

The iMlango-T evaluation measure each of the outcomes and intermediate outcomes as set out in the GEC guidance. Measurement for all of the indicators for the evaluation are done at the key evaluation points, with the following indicative timeline:

- **Baseline study:** Research fieldwork conducted in May 2018
- **Midline study:** Research fieldwork conducted in May 2019 (12 months after baseline data collection)
- **Endline study:** Research fieldwork conducted in September-October 2020

For the endline study we propose to start the fieldwork in September-October 2020 and more specifically the testing of the students so that there is enough time to process the bulk of the data before project ends. There may be need to collect data on transition to secondary school in January 2021. This splitting of the endline fieldwork will also allow us sufficient time to re-visit the schools and households if needed to collect additional information or repeat parts of the data collection if necessary.

Intermediate outcomes have been developed alongside to the ToC as set out below. Table 2-1**Error! Reference source not found.** outlines each of these principle indicators, along with summary measurement information, source, rationale and frequency.

Table 2-1: Outcomes for measurement

Outcome	Level at which measurement will take place	Tool and mode of data collection	Rationale	Frequency of data collection
Literacy	School but could follow up in the household	EGRA & SeGRA type learning test	This is a GEC-T wide approach.	At Baseline, Midline and Endline
Numeracy	School but could follow up in the household	EGMA & SeGMA type learning test		At Baseline, Midline and Endline
Transition	Household with school as secondary source	Transition module of the household survey (HHS)		At Baseline, Midline and Endline
IO 1: Improved attendance among certain pupil sub-sets in primary schools	Primary school	sQuid attendance monitoring system in the treatment schools complemented by attendance spot checks by the EE and field team – data to be disaggregated by sex, County and intervention group. Disaggregation by disability will only be possible for the girls that have completed the GSS.	In iMlango-1 the project proved that the attendance data coming from the monitoring system were more reliable than the school registers and therefore this system will continue to be used for tracking attendance.	Attendance is taken daily in the schools and reported termly. In the logframe the figures will be updated annually. Spot checks by the EE per evaluation point. The rest of the spot checks to add up to the 2 required spot checks per annum will be conducted by the project field team.

Outcome	Level at which measurement will take place	Tool and mode of data collection	Rationale	Frequency of data collection
IO 2: Improved quality of teaching using ICT by the primary school teachers	Primary school	Survey with teachers, classroom observations and interviews with iMlango Champions, teachers & headteachers	This mix of tools will be able to provide information about how teachers apply the training they have received to improve their teaching quality.	At Baseline, Midline and Endline
IO 3: Learning progress by girls in primary schools	Primary school	Whizz central reporting tool data and portal data provided by the project and Girls School survey by the EE	The Maths-Whizz central reporting has proven useful in iMlango-1 in tracking continuously the progress of students that have access to individualised learning enabling real-time intervention from their teachers and the project.	At Baseline, Midline and Endline
IO 4: Improved life skills for girls	Primary school and CIH	Combination of targeted surveys directed at confirmed club members and FGDs with a small sample of them.	These tools will be able to provide a view on how girls life skills, confidence and aspirations have changed because of the intervention.	At Baseline, Midline and Endline
IO 5: Increased use of iMlango reports by key stakeholders to inform their decision making and actions to support schools	Primary schools	Interviews and FGDs to understand what kind of actions the key stakeholders are taking.	These tools will enable us to unpack the views of the key stakeholders around the usefulness and relevance of iMlango data reports to their everyday workload which will help with sustainability.	At Baseline, Midline and Endline

The project's approach to sustainability is detailed in the Sustainability Plan and progress against the plan is tracked by the project. In the logframe a number of indicators have been identified for the Sustainability Outcome that are evaluated by the EE at Baseline, Midline and Endline.

The Sustainability Plan also articulates the importance of addressing the deep-rooted causes of gender inequality, by ensuring that interventions include a focus on challenging harmful social norms, responding to economic opportunities for women and girls. These are much more likely to transform the underlying gender dynamics and to support sustainable change in communities. Therefore, the project's girl clubs will be designed to be a space where girls and boys can engage, both in single-sex safe spaces and together, in a dialogue around the norms and attitudes that drive inequality. Boys will also be encouraged to speak out as role models and allies, working towards longer-term gender equality.

The table below, details the methodology for measuring the sustainability of the Outcomes and Intermediate Outcomes. It shows the sustainability level (school, community, system), indicators being collected, source of the data, rationale and frequency of data collection.

Table 2-2: Sustainability outcome for measurement

Sustainability Level	Indicator	Where will measurement take place?	What source of measurement/verification will you use?	Rationale	Frequency of data collection
School	% of school Board of Management (BoM) that are actively supporting the project	School	Interviews with heads of BoM and/or FGDs	We used KII with BoM to understand how engaged they are with the project and whether they have actively supported it with specific actions (for example by raising money or holding the headteachers and teachers accountable in the use of the resources).	Baseline, Midline and Endline
	Aspirations of female and male students in relation to their future education and career prospects	School	Focus group discussions with students	We conducted FGDs with both school girls and boys to gauge any change in their aspirations that can be attributed to the intervention. Research conducted by the Young Lives project shows that aspirations are a useful proxy indicator for learning outcomes and changes in aspirations can indicate whether improvements in learning outcomes achieved through the intervention can be sustained in the future.	Baseline, Midline and Endline
	Levels of confidence of school leadership in their ability to help sustain specific aspects of the intervention	School	Interviews with headteachers	We included a section on confidence levels of school heads in their ability to help sustain particular aspects of the intervention that they have control or influence on.	Baseline, Midline and Endline
Community	Improvement in perceptions of parents and community leaders on the value of investing in girls education	Household or community	FGDs with mothers, father and community leaders	Qualitative research with parents and community leaders to generate insight into shifts in attitudes and behaviours around gender equality.	Baseline, Midline and Endline
	Income generated by the community for internet access	Community	Project data	Project data on income generated will be readily available when this service is made available.	This will be reviewed at a quarterly basis for the QER but will be

Sustainability Level	Indicator	Where will measurement take place?	What source of measurement/verification will you use?	Rationale	Frequency of data collection
					reported at Baseline, Midline and Endline.
	Improvement in the perceptions of parents and community leaders to sending learners to schools that advocate for learning through technology	Household or community	Household surveys	Household surveys with parents on their perceptions that technology is making a difference to the learning experience of children. This helped to indicate if parents and community leaders see the intervention as an effective approach to educational delivery and will support keeping their children in school or send their children to such schools in the future.	Baseline, Midline and Endline
System	Advocacy of county level education officials (DEO & CSO) for changes to existing education system (policy, resources, processes) as a result of learnings from intervention	County	Interviews with county level officials	Interviews were conducted with county level officials to identify if the learnings from involvement has resulted in local education officers directly advocating for a change to the existing system. They could be in the form of policy changes at local or national level, demanding resource allocation or a change in processes.	Baseline, Midline and Endline
	Levels of confidence of county level education officials (DEO & CSO) providing leadership and support ICT based teaching and learning approaches	County	Same as above	In addition to the above, we interviewed the county level officials on their levels of confidence in their own abilities to contribute to their sustainability of the intervention. This will also allow for further investigation of specific areas where the officials feel less confident so that they can be supported during the intervention. The specific aspects that will be surveyed relate to the areas of the intervention that county officials have some control or influence on.	Baseline, Midline and Endline

2.3 Evaluation methodology

2.3.1 Overall Evaluation Design

In this assignment, we adopted a mixed method evaluation methodology employing both qualitative and quantitative data gathering approaches to generate more in-depth information about the intervention and provide rich datasets. This creates reliability and credibility of findings of different evidence and enables generation of credible findings. As mentioned in the GEC-T MEL guidance, taking such an approach can strengthen an evaluation, both through triangulation of findings and by building a deeper understanding of how and why change has/hasn't occurred. Our quantitative data included learning outcomes (literacy and numeracy skills), Household surveys, School surveys (responded to by the Headteachers), classroom and lab observations; and Teacher surveys. The qualitative data included in-depth interviews with key informants (Headteachers, DEOs, chiefs) and focus group discussions (girls, boys, fathers, mothers, teachers).

As with any project, the key evaluation problem lies in being able to attribute change to the intervention. Since we cannot simultaneously observe the same individuals having been exposed to or not exposed to the project, the evaluation must attempt to create a counterfactual. That is, treatment and comparison groups that are as similar as possible so that any changes observed can be assumed to be the result of the project rather than any initial differences between the groups. The study is longitudinal using a quasi-experimental design with repeated measures at baseline, midline and endline. The design will allow us to make repeated observations of the same variables over the study period so as to identify patterns and quantifying trends in the outcomes of interest.

The evaluation used a difference-in-difference (DID) approach to measure the effects between intervention and comparison schools. The DID approach is preferred in quasi-experimental to account for initial or baseline differences. The comparison schools and the pupils selected in them were matched by location (sub-county) and class to ensure that the two (intervention and control) groups are as similar as possible except that the treatment groups benefit from the intervention and the control group does not. Selecting at location and class level also ensured that the target beneficiary groups and subgroups are represented in the sample, and distributed proportionately across the participating counties. To identify the schools to participate in the study, Probability Proportionate to Size (PPS) sampling was used to select 52 schools out of the 140 schools in group A (+C); 33 schools from the 65 Group B schools and 33 from the 65 Control schools. The method ensured equitable representation of the number of schools per county. Since the participating schools were already predetermined in the first phase of the project, there was lack of "pure" randomness in selection of schools. To correct this limitation, we matched intervention and control schools by the sub-counties they belong to. Additionally, we collected data on baseline characteristics of the schools and pupils for purposes of adjusting the effect sizes should there be huge differences on the characteristics at baseline.

Changes over time will be measured in the two groups. By employing this 'double difference' approach (looking at changes over time and across treatment versus control groups), we can separate out changes that are occurring naturally in all areas from those changes brought about by the project itself. In this way, we effectively address the challenge of the counterfactual: assessing what would have happened in the absence of the project through the use of treatment and comparison areas over multiple time periods. This design will allow for mimicking a counterfactual scenario at each evaluation stage and iMlango-T Project results to be estimated using DID calculations and confirmatory analysis made through regression. The study design is illustrated in Figure 2-1, below.

The identified target direct and indirect beneficiary groups have been presented in Box 1 under Section 1.3.

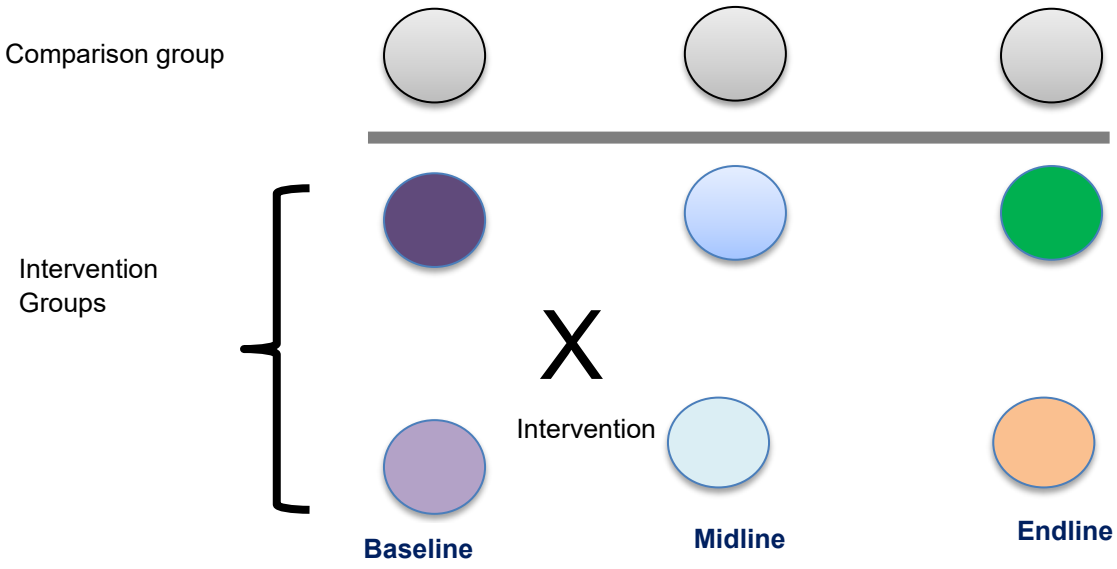


Figure 2-1: Study design for the iMlango-T project Evaluation

2.3.2 Evaluation of the Cohort of Girls

To ensure a wider range of children at the schools are covered, three grades will be tracked as the cohort. Table 2-3 shows the likely progression of grades based on the baseline study starting in May 2018, Midline in May 2019 and Endline in September-October 2021. This highlights three grades at baseline – Standards 2 (S2), 6 (S6) and 7 (S7). The progression of the last grade will take it to secondary school, and allow the transition rate to be assessed, while the S6 cohort will also transition to secondary school in the final year of the project.

Table 2-3: Cohort across time for different Standards starting from 2017 to 2021

GEC-1 Endline (2017)	Pre-primary	S1	S2	S3	S4	S5	S6	S7
Mar 2018 (Baseline)	S1	**S2**	S3	S4	S5	**S6**	**S7**	S8
Jan 2019 (Midline)	S2	**S3**	S4	S5	S6	**S7**	**S8**	F1
Sep 2020 (Endline school survey)	S3	**S4**	S5	S6	S7	**S8**	**F1**	F2
Jan 2021 (Endline HHS)	S4	**S5**	S6	S6	S8	**F1**	**F2**	F3

Key Learning & assessment Transition | Learning assessment | Transition assessment

i. Learning cohort

The learning cohort was selected at the primary schools at the baseline study in the grades set out in Table 2-3 – S2, S6 and S7. Girl surveys were undertaken to gather basic but important information on knowledge, attitudes and perceptions, including self-esteem and perceptions of safety in and around school, and background details of the students including information on age and the distance to school they travel. In addition, we gathered information on compliance with respect to experience of the iMlango interventions – use of ICT lab, Maths Whizz, stipend or microfinance provision, membership of girls' club etc. in surveys.

This survey builds from the FM's Girls' School Survey (GSS). The girls from who data was collected were assigned a unique identification number (ID) that will be used to match their learning test to the GSS and HHS.

EGRA/EGMA and SeGRA/SeGMA learning tests were developed to evaluate learning of girls. We administered EGRA and EGMA with either some or all subtasks (depending on grade) to all the selected girls. SeGRA and SeGMA were administered to Grades 3 and above again with either some or all subtasks depending on the grade. However, the EE decided to administer all the subtasks as the marginal cost of collecting this additional data was minimal. This learning assessment allows for evaluation of learning progress across the cohort in a way that enables calculating an aggregate learning score, which is the key metric of the GEC-T learning outcome. The subtasks that overlap across all grades will be used to calculate the aggregate learning score. The table below summarizes the learning tools administration plan.

Table 2-4: Learning test tasks distribution to cohort grades for all evaluation points

Baseline Grade	Tools and subtasks to administer		
	Baseline (Mar 2018)	Midline (Jan 2019)	Endline (Sept 2020)
S2	EGRA / EGMA – All subtasks	EGRA / EGMA – All subtasks SeGRA/SeGMA-Sub-task 1	EGRA / EGMA – All subtasks SeGRA / SeGMA - Sub-task 1
	(Target: Grade 2)	(Target: Grade 3)	(Target: Grade 4)
S6	EGRA / EGMA – All subtasks SeGRA / SeGMA - all sub-tasks[27]	EGRA / EGMA – All subtasks SeGRA / SeGMA – all sub-tasks	EGRA / EGMA – All subtasks SeGRA / SeGMA - All sub-tasks
	(Target: Grade 6)	(Target: Grade 7)	(Target: Grade 8)
S7	EGRA / EGMA – All subtasks SeGRA / SeGMA - all sub-tasks	EGRA / EGMA – All subtasks SeGRA / SeGMA - All sub-tasks	EGRA / EGMA – All subtasks SeGRA / SeGMA - All sub-tasks
	(Target: Grade 7)	(Target: Grade 8)	(Target: Grade 9[28])

ii. Transition cohort

The transition cohort was sampled directly to link to the learning cohort and was a subset of that cohort (i.e. every girl tracked for transition had been tested for learning at school and a student survey had been undertaken). The sample was drawn randomly to be entirely representative of the learning cohort.

The crucial and difficult part of the process was tracking down the household once these girls had been selected at the school. All girls in the transition cohort had undertaken a GSS with basic information, but the details of the girls' addresses were collected via the Interviewees Listing Form (detailed form filled for everyone who participates in Research). Once the address information was gathered, the school informed the parents and requested consent for the HHS interview. A protocol for this communication was developed to ensure an ethical and practical process was put in place. When the enumerators visited the households, they matched the girls' unique ID (supplied by the implementer) to the HHS.

At the progression of the data collection, it became apparent that there were many call-backs for the HHS because of the vast distances that the enumerators needed to travel to reach the households. The situation

[27] Originally, grades 6 & 7 were expected to do sub-tasks 1 and 2 only. However, the EE administered all the subtasks as the marginal cost of collecting this additional information was minimal.
[28] This is the first grade of secondary school also known as Form 1 (F1).

was compounded by the impassibility of roads due to the heavy rains being experienced in the country then. Permission was then sought and obtained from the FM to have the HOH/Caregivers come to the school for the interviews. This strategy proved successful in having more interviews conducted.

2.3.3 Roles of quantitative and qualitative data in the evaluation

The methods followed at baseline are set out in Table 2-5 for schools and Table 2-6 for communities. Analyses of qualitative data collected during KIIs and FGDs was systematically processed using a coding system for each outcome area. The coding examined school and community stakeholder perceptions of the intervention and its components in relation to girls' transition and learning as primary outcomes, along with changes in gender equity and girls' self-esteem and aspirations as supportive factors. These data were analysed using NVivo qualitative analysis software to inform key findings and conclusions.

At Midline, further research in addition to this will be required for the CIHs, which will be designed nearer the time when the CIH intervention is finalised and operational.

Table 2-5: Summary of methods used for the qualitative and quantitative research at the school

Tool	Goal	Sampling methodology	Total number	Indicators the tool is contributing to
Quantitative tools				
Learning tools (EGRA/EGMA; SeGRA/SeGMA	Capture information on learning outcomes (numeracy and literacy) for the target learners	Random among 118 schools for grades 2,6,7	3,894	Outcome 1
Girl School Survey	Capture information of Girls' learning, life-skills, teaching quality and attitudes towards ICT and learning	Random among 118 schools for grades 2,6,7	3,894	Outcome 1 IO1-Attendance IO2-Quality of teaching IO3-Progress of girls I04-Life-skills
Household Surveys	Capture information for the transition indicator	Random among those selected for the learning indicator	2596	Outcome 2-Transition
School survey (primary schools)	Capture summary information about the primary school including the number of pupils, KCPE average scores, school fees charged (formally or informally) and other information	10 Group A and 10 Group B schools	20	Triangulation of Outcome 1 and useful background information
Attendance spot check	To capture information on the attendance indicator. Two classes were sampled per school.	All intervention evaluation schools; 52 Group A and 33 Group B	85	IO 1
Teacher questionnaire	Capture the experience of the teachers in iMlango, the difference it has made on their students learning, what has worked and what not.	2 teachers per Group A and B evaluation school; one teacher per school would be an iMlango champion	170	Outcome 3, IO 2 and Output 1
Classroom observation	Understand how the ICT infrastructure is being used in the lab and in the classroom by the teachers and students. Gendered dynamics (teacher-student/student-student)	52 lab observations from Group A and 33 whole class observations from Group B	85	IO 2

Tool	Goal	Sampling methodology	Total number	Indicators the tool is contributing to
	was observed and all data disaggregated by sex.			
Qualitative tools				
Headteacher KII	Discuss with the headteachers about their experience with iMlango, including how they use data generated from the attendance and learning systems, and how they manage the intervention.	5 from Group A and 4 from Group B	9	Output 5
FGDs with school BoM	Discuss the experience of the iMlango project and use of technology as well as broader issues including transition	6 FGDs with 6 participants each; 2 FGDs per County	36 (6 FGDs*6 pax)	Outcome 3, Output 5
FGDs with boys	Explore the views of boys with respect to their education and the iMlango resources and project interventions. Also explore attitudes to gender, their education and girls' education.	6 FGDs with 8 participants each	48 (6 FGDs*8 pax)	Information about boys' change of attitudes/views towards girls education
FGDs with girls	Explore what the views of the girls are towards their education and the difficulties they face, how they feel about the project and whether they think it has made a difference. More specifically the tool will feed into Output 4 around girls' self-confidence to support the findings of the girls' questionnaire.	9 FGDs with 10 participants each	90 (9 FGDs*10 pax)	IO 3, IO 4,
FGD with teachers	Explore the situation for the teachers in the schools and get their view on the project, what worked, what issues they faced and what they would do differently.	6 FGDs with 9 participants each	54 (6 FGDS *9 pax)	Outcome 3, Output 1

Table 2-6: Summary of methods used for the qualitative research at the community

Tool	Goal	Sampling methodology	Total number	Indicators the tool is contributing to
Interview with parents receiving the stipend or microloan	Explore what issues the family was facing that affected attendance, if the stipend has worked and why. Do the parents understand the impact of their children attending school more frequently and what improvements have they noticed if any?	2 parents from 6 selected Group A and B communities	12 (6 communities*2 pax)	Output 3
KIIs – DEOs and CSOs	Explore the perceptions of the education officials on iMlango, what, if at all, they are promoting its implementation. The effect of iMlango on decisions they are making about education for girls in particular	2 per County will be interviewed; 1 DEO and 1 CSO	8 (4 Counties* 2pax)	Outcome 3

Tool	Goal	Sampling methodology	Total number	Indicators the tool is contributing to
FGDs with mothers (younger and older)	Explore what the views of the mothers are towards girls' education and what they do about it, how they feel about the project and whether they think it has made a difference. *(limited to 3 communities per group)*	3 FGDs with 9 participants each, 2 with younger mothers (below 35 years of age) and 1 with older mothers (above 35 years old)	27 (3 FGDs*9 pax)	Outcome 3 - Information about mothers' change of attitudes/views towards girls education
FGDs with fathers	Explore what the views of the fathers are towards girls' education and what they do about it, how they feel about the project and whether they think it has made a difference. *(limited to 2 communities per group)*	2 FGDs with 6 participants each, one with younger fathers (below 35 years of age) and another with older fathers (above 35 years old)	12 (2 FGDs*6 pax)	Outcome 3 - Information about fathers' change of attitudes/views towards girls' education

2.3.4 Evaluation of the assumptions concerning the relationship between IO and outcomes

Table 2-1 shows the measures for IO and outcomes, as well as the rationale for adapting the measures.

The theory of change assumes that IOs are enablers allowing to achieve the project outcomes. Such assumptions will be tested through both qualitative approaches and statistically associating sub-group data on IO and outcomes at the midline evaluation point. Specifically, IO1- Improved attendance among certain groups of girls in primary schools – the EE will test if improved attendance is associated with learning and/or transition outcomes. IO2 - Improved quality of teaching using ICT by the primary school teachers – we shall examine if classes and/or sub-group of girls exposed to ICT teaching score better than those not exposed and evaluate how sustainable the effect of these changes are. IO3 –project assumes that learning progress by girls in primary schools involves exposing girls to personalised tutoring on Math-Whizz and literacy content available on the portal. The EE will test if such exposure provides any learning advantage by comparing the scores of those exposed to the overall group scores and/or to those not exposed. IO4 - the improved life skills for girls that include exposure to CIH and clubs. The activities of the clubs aim to improve girls' life skills, confidence and aspirations. The EE will test if such exposure is linked to improved transition. Last but not least, in the IO5 on increased use of iMlango reports by key stakeholders to inform their decision making and actions to support schools, we shall use stakeholder perceptions index to evaluate if the presence of such reports is thought to be associated with achieving improved learning outcomes at school level and links to the more sustainable effects of the project. The quantitative approaches require matching multiple data sets collected by both project partners and EE and pose a challenge around the anonymity of the EE data sample. The best approach to address these concerns requires further discussion and guidance from the FM.

2.3.5 Incorporation of GESI Minimum Standards into the Evaluation

Consistent with international evaluation practice and recognizing that effects of integration and the success of the activity might vary across gender, the evaluation team applied a gender perspective to the entire evaluation process. Being sensitive and cognisant of the prevailing gender norms in the target communities, use was made of gender balanced local staff in primary data collection in their respective counties. Our data collection tools were gender disaggregated where applicable and one of our deliverables is a gender analysis of the project to be led by our Gender and Social Inclusion Expert. The analysis will reveal the effect and extent of gender norms and practices to the attainment of the iMlango-T Project objectives in the

target areas at midline. These norms will include: attitudes towards educating the girl-child, attitude of the girls towards use of ICT in education, and extent to which the school infrastructure is sensitive to the girl-student population.

In addition to issues of gender, the evaluation team considered issues of social demographics in the sampling and data analysis processes, and how they may affect the outcomes of the activity and/or the evaluation findings. These include data such as the disability status of the pupils, the social competence status of the pupils including self-esteem and life-skills, marital status of the adult respondents; and income status of the adult respondents.

The project targets girls' education though it recognises the importance of male engagement in girls' and women programmes. The study population included a small sample of boys, as indicated in the iMlango-T MEL framework mainly in the qualitative data collection (FGDs with parents and boys). The household interviews included both male and female respondents particularly parents and head of households. These provide important perspectives on socio-cultural issues affecting their families and communities. The approximate number of children with disabilities, including the type and severity of disability was determined using the UN Washington Group Methodology incorporated in the Girl School Survey and the HHS tool for transition cohort tracking.

2.3.6 Approach to Learning and Transition Benchmarking

Benchmarking according to the GEC methodology is utilised for grades separate from the cohort grades. This benchmarking is done for two main reasons:

- To set targets based on the standard deviation of the benchmark grade.
- To ensure that learning tests are fit for purpose and are not likely to hit ceiling effects as students move to higher grades.

i. Benchmarking for learning

The learning cohort consists of Grades 2, 6 and 7, who will progress to Grades 3, 7 and 8 respectively at midline; and Grades 4, 8, and Form 1 respectively at endline as shown in Box 3 below.

Box 3: Benchmarking for learning and transition (External Evaluator)

Baseline (2018)	Midline (1 year later, 2019)	Endline (2.5 years later, 2020)
Project grades		
S2	**S3**	**S4**
S6	**S7**	**S8**
S7	**S8**	**F1**
Benchmark grades		
S3	n/a	n/a
S4	n/a	n/a
S8	n/a	n/a
F1	n/a	n/a

From the benchmark grades presented in the previous table, Grades 2, 6 and 7 are part of the cohort so a sample from the following 4 grades needed to be tested for benchmarking during the baseline data collection: Grade 3; Grade 4; Grade 8; and, Grade F1. For baseline, we randomly selected 40 girls from each of the Grades 3, 4, 8 and F1 for benchmarking which adds up to a total of 160 girls. The table below shows the learning tests and corresponding tasks that were used for benchmarking in each Grade.

Table 2-7: Test tasks delivered for learning benchmarking per grade

Grade	Number of girls	Learning test to be administered
Grade 3	40	EGRA and EGMA SEGRA and SEGMA Subtask 1
Grade 4	40	EGRA and EGMA SEGRA and SEGMA Subtask 1
Grade 8	40	EGRA and EGMA all subtasks SEGRA and SEGMA all subtasks
Grade F1	40	EGRA and EGMA all subtasks SEGRA and SEGMA all subtasks
Total	160	-

To ensure that the sample was geographically broadly representative, the distribution of the girls selected was 10 per grade per county as shown in the table below.

Table 2-8: Sample per grade for learning benchmarking

Grade	Kilifi	Makueni	Kajiado	Uasin Gishu	Total
Grade 3	10	10	10	10	40
Grade 4	10	10	10	10	40
Grade 8	10	10	10	10	40
Grade F1	10	10	10	10	40
Total	40	40	40	40	160

~~iii.~~ii. Benchmarking for Transition

Transition was benchmarked through the use of HHS in the communities around the evaluation schools (Group A/C and B). According to Schaefer et. al. (2012), the minimum number of households for statistical precision for high-quality estimates of the variables of interest is 26 (multiplied by four counties yields 104). However, because the GEC-T benchmarking approach is age-based, the sample included an additional ten girls over eleven age bands (ages 8 through 18), for a total sample of 214 households. These households were sampled proportionately from the Counties as shown in Table 2-9.

In each of the selected households, our Field Investigators spoke to the Head of Households to identify the girls aged 8-18 years in the specific household and their primary caregiver. They then selected the girl for benchmarking the transition outcome using Kish Grid and interviewed the primary caregiver of the girl. Both the Head of Household and the Primary Caregiver interviews are included in the HHS for transition benchmarking tool which is an adaptation of the core HHS. This interview illuminates the school enrolment status of the girl in the current and previous year.

Table 2-9: Benchmarking sample for transition

County	Group A+C	Group B	Total
Kilifi	29	27	56
Makueni	28	25	53
Kajiado	26	25	51
Uasin Gishu	28	26	54
Total	111	103	214

2.4 Baseline data collection process

2.4.1 Pre data collection

i. Quantitative Sampling Framework-Learning Cohort

The power calculations for the learning cohort quantitative sample were undertaken to achieve a 0.25 standard deviation (SD) effect size for girls as is the requirement set out in the GEC guidance. The levels of precision are reported below for both the individual group comparisons (A vs. B etc.) as well as the combined comparison for treatment vs. control (A+B vs. D). The two sets of calculations based on 30 schools per group are shown in Table 2-10. This shows that the 0.25 SD target is met for girls in the group-wise comparison and easily met for the treatment-control comparison.

Power calculations were carried out using the online tool developed by the University of California at San Francisco which conducts t-tests for clustered samples for a treatment and control group, assumed to have independent means and be normally distributed. Attrition is assumed to be 20% for S2, S6 and S7; which is lower than that experienced in the iMlango Endline evaluation in GEC-1, however with better practices in place and more robust statistical design, it should be achievable.

Table 2-10: Group-wise comparisons for learning sample

	Group A (+C)	Group B	Group D (Control group)	Total
Number of Schools	140	65	65	**270**
Sample Schools	52	33	33	**118**
Girls per school	33	33	33	**-**
Total sample	**1,716**	**1,089**	**1,089**	**3,894**

The assumptions made in the power calculations were:

- Two-sided t-test for two independent means
- Power = 80%
- Level of significance = 5%
- Intra-cluster correlation (ICC) = 0.10
- Rounding up to ensure adequate sampling power
- Attrition = 20%
- Effect size for 2-sided analysis (for group comparisons B vs. D, A vs. D, & A vs. B) = 0.25 SD

ii. Quantitative Sampling Framework-Learning Transition Cohort

The transition cohort was taken as a slightly smaller subset of the learning cohort with a total of 2,596 girls being tracked to the household for transition. This was 22 girls per school per group distributed thus: 7 girls per school per group for S2; 7 girls per school per group for S6; 8 girls per school per group for S7 as shown in the Table 2-11 below. The transition rates should be calculable fairly easily for in-school girls in the learning cohort even if HHS is not conducted – i.e. if they are found again at Midline in the grade above in school, they will have successfully transitioned. This factor is not taken into account in the calculation below to ensure the assumptions are conservative, however it will of course mean a greater level of precision is possible.

The calculations show that for group-wise comparisons an 11.9% to 12.8% effect size would be measurable if the Baseline transition rate was 70% (which is approximately what it should be weighting the cohort selected). For the treatment-control comparison, the minimum detectable effect size is between a 9.6% and 11.2% effect size. The range is dependent on the application of clustering. It is not possible to estimate the correct intra-cluster correlation as data is not available, but 0.10 can be used as a rule of thumb.

It is important to note that this is based on a 20% attrition rate which may be higher for the HHS tracking cohort because of the additional difficulties involved. However, on the plus side the calculations above (including for learning) are undertaken without any assumption about covariates being included in the regression analysis. Additional data for girls in the sample will potentially increase the likelihood of having p-values of less than 0.05 in the final analysis. It is possible that the calculations will be more precise than the above if the evaluation is conducted effectively and successfully.

Table 2-11: Group-wise comparisons for transition indicator

	Group A (+C)	Group B	Group D (Control)	Total
Number of Schools	140	65	65	**270**
Sample Schools	52	33	33	**118**
S2 – Girls per school	7	7	7	**-**
S6 – Girls per school	7	7	7	**-**
S7 – Girls per school	8	8	8	**-**
Total girls per school	22	22	22	**-**
Girls S2 subtotal	364	231	231	**826**
Girls S6 subtotal	364	231	231	**826**
Girls S7 subtotal	416	264	264	**944**
Girls total transition sample	**1,144**	**726**	**726**	**2,596**

The assumptions made in the power calculations for the transition cohort are:

- Two-sided t-test for two independent means
- Power = 80%
- Level of significance = 5%
- Intra-cluster correlation = 0.10
- Attrition = 20% for all groups except Grade 7 transition group which is 30%
- Assuming Baseline transition is 70%; and endline is 80.9% (i.e. +11.9% effect size)
- Clustering not applied (assuming Baseline proportion is 70%; and endline is 82.8% (+12.8% effect size)

iii. Qualitative Sampling Framework

In addition to the quantitative sampling frame as presented above, the research also included a clear qualitative sampling frame that will be implemented at the evaluation points. For reasons of cost-effectiveness, the qualitative and quantitative research components were carried out simultaneously in each of the counties. Table 2-12 summarises the qualitative sample that was drawn from the evaluation schools and related communities. In total this means a package of qualitative research with 21 schools, and 15 communities. Secondary school communities were not sampled separately as it is assumed they overlap with primary communities.

Table 2-12: Package of quantitative and qualitative research by group

Evaluation Group	A(+C)	B	D (Control)	Secondary schools	Total
Total number of schools / communities	140	65	65	40	310
Learning sample	52	33	33	(10)	128
Household survey sample	52	33	33	(0)	118
Qualitative research sample in schools	5	5	5	6	21

Evaluation Group	A(+C)	B	D (Control)	Secondary schools	Total
Qualitative research sample in communities	5	5	5	(0)	15

The 15 primary schools/communities comprising the qualitative sample were selected proportionately to the number of schools selected per county, thus: 2 in Kajiado County; 5 in Kilifi County; 4 in Makueni County; and 4 in Uasin-Gishu County. The qualitative package per school and community included FGDs and KIIs. The distribution of respondents to the various qualitative research is as shown in Table 2-13.

Table 2-13: Distribution of qualitative interviews by county

County	KII-HT	FGD boys	FGD Girls	FGD Teachers	FGD BOM	FGD Fathers	FGD Mothers	KII DEOs	KII Chiefs	IDI Stipend parents
Kajiado	1	1	1	1	1	0	0	2	2	2
Kilifi	4	2	4	2	2	1	1	2	2	4
Makueni	2	1	2	1	1	1	1	2	2	3
Uasin Gishu	2	2	2	2	2	0	1	2	2	3
Total	**9**	**6**	**9**	**6**	**6**	**2**	**3**	**8**	**8**	**12**

iv. Design of the Research Instruments

The research instruments were developed as follows:

- Learning Tests: (EGRA, EGMA, SeGRA and SeGRA) were developed following the blueprints provided by the FM and with the technical support of practicing teachers who are also test developers for Kenya National Examination Council (KNEC) and they are familiar with the current syllabus.
- Household Survey and Girl School Survey: These tools were based on the FM provided templates and customized to the iMlango Project by incorporating extra questions as needed and having the responses corresponding to the four intervention counties
- Benchmarking for Transition tool: This was developed as part of the HHS tool with only the Head of Household and Primary Caregiver modules as per the FM provided template.
- Additional quantitative data collection tools: The School Survey, Teacher Survey, Classroom and Lab Observation tools were developed to respond to the relevant outcomes and intermediate outcomes according to the MEL Framework. They were developed in consultation with the FM and the project and modified accordingly after piloting. Some of the questions included in these instruments were retained from the original iMlango-1 tools.
- School qualitative tools: The FGD girls, FGD Boys, FGD Teachers, FGD BOM, KII with MOE Officials and KII for Headteachers were developed to measure perceptions on the use of ICT for learning, contribution by the stakeholders to sustainability of the Project, to establish if the discussants felt that the Project has made a difference. They were developed in consultation with the FM and the project.
- Community qualitative tools: Interviews with parents receiving stipends, KII with Chiefs, FGD fathers, FGD Mothers were developed to measure the perceptions of the participants towards the Project, use of ICT for learning; and their contribution to the sustainability of the Project. They were developed in consultation with the FM and the project.

v. Preparation of the tracking of cohorts in future

The details of all the pupils interviewed were entered in Learner Name Forms. The details captured include: name of pupil, pupil unique ID assigned by EE to anonymise the data, pupil date of birth, school, grade, name of parent/guardian, telephone contact of parent/guardian, name of the school, as well as the mobile phone details of the headteacher and class teacher. These records will enable follow-up with the pupil, where necessary, during the next evaluation points.

vi. Piloting of Instruments

Piloting of data collection tools took place on three occasions. An initial pilot was conducted on Monday, 6th March, 2018 and follow-ups on Friday, 10th March, 2018, and 3rd April 2018. The goals of the pilot were to test the data collection tools, in particular the items on the EGRA/EGMA and SeGRA/SeGMA assessments; refining the tools on the electronic platform; and estimating the level of output that the data collection team would reasonably meet on a normal working day.

The instruments piloted included:

- 3 Versions of EGRA: EGRA A, EGRA B and EGRA C
- 3 Versions of EGMA: EGMA A, EGMA B and EGMA C
- 3 Versions of SeGRA: SeGRA A, SeGRA B and SeGRA C
- 3 Versions of SeGMA: SeGMA A, SeGMA B and SeGMA C
- Girls School Survey
- School Survey
- Attendance Spot Checks

The psychometric properties of the tools used in pilot were examined and the results were used to refine the final tools. A vast majority of the students taking part in the piloting took two versions of the learning tools but some took only one version. Administering all the three versions to the same student proved to be a challenge because of the long length of time involved in taking these tests and associated student fatigue.

Following the analysis of the Pilot Results, decisions about which versions of the tests to keep were made based on the versions that had the least number of items showing poor discrimination. The items in the chosen version that showed ceiling effects were dropped-as this implied that these may not be suitable for assessing learning progress. The items showing poor discrimination will be re-examined after the baseline study. The piloting procedures were documented and a report was submitted and approved FM before proceeding to the baseline study.

The piloting happened in 3 non-evaluation intervention schools in Kajiado County. The reason for the second and third round of piloting was that insufficient data was collected the first time due to logistical challenges related to adverse weather conditions in particular from heavy rains that resulted in difficult road conditions that made part of the country inaccessible. The team arrived at the first school only at around midday and was therefore only able to conduct interviews with the Grade 2 participants in the first school. By the time the first round of interviews was completed, it was already time for the student lunch break and the early Grade pupils do not return back to school in the afternoon. Consequently, the early Grade pupils in the second primary school would not be available for the interviews.

Following analyses of the pilot data looking at ceiling and floor effects; and item-discrimination, decisions about the learning tests to be used during the main baseline research were made. The tests shown in the table below were chosen.

Table 2-14: Learning tools recommended for use in the main study

Tool	Version to use	Action to be taken, moving forward
EGRA	Version A	Re-examine the 16 items showing poor discrimination after baseline study
EGMA	Version A	Delete items on number identification and number discrimination because of ceiling effects
SeGRA	Version A	Re-examine the two items showing poor discrimination after baseline
SeGMA	Composite	Re-examine the item showing poor discrimination after the baseline study

The details of the learning test pilot and calibration were shared with Avanti and the FM in the "iMlango-T Evaluation Baseline Pilot Report v1.3" before the start of the baseline data collection.

vii. Recruitment of the enumerators

Enumerators were recruited from an existing database of enumerators in the four intervention counties. An advert detailing the qualifications needed was sent out. The candidates who were interested submitted application that was later reviewed internally. All the prospective enumerators were asked to come with an updated Certificate of Good Conduct. The key criteria that were required the enumerators to demonstrate included:

- At least university degree level of education;
- Experience of having been involved in enumeration in at least two recent (within 3 years) projects;
- For qualitative enumerators: an additional demonstrable experience in interviewing key informants;
- Resident of the target county and conversant with the local language; and
- An updated Certificate of Good Conduct from the Kenya Police.

Shortlisting of the candidates yielded 103 enumerators, which included 87 quantitative and 16 qualitative enumerators. These underwent 5-day training (and later an additional 3-day re-training) with further assessments on their capacity. The final number was 82 enumerators (68 quantitative and 14 qualitative) who qualified. They were divided into 8 teams with 3 teams for Kilifi, 2 each for Makueni and Uasin Gishu; and 1 team for Kajiado. From among the teams, County Supervisors and Team Leaders were selected based on proven skill and experience.

viii. Training of Enumerators

The enumerators received a 5-day training and later a 3-day retraining. The repeat training was occasioned because of moving the baseline survey data collection to the second term after heavy rains caused the closure of schools especially in Kajiado County. The training program included sessions by the EE Project Director, Project Manager, Field Coordinator, Educational Assessments Expert, Gender and Social Inclusion Expert, Data Analysts, Enterprise Development Expert and the Project Software Programmers.

The following topics were covered during the training:

- Overview of the iMlango -T Project
- Objectives and scope of the iMlango-T project evaluation
- Ethical issues in research
- Informed consent procedures for iMlango evaluation
- Child Protection Policy and Code of Conduct
- Overview and specific instructions for quantitative and qualitative data collection tools
- Gender lens to be applied in the iMlango-T evaluation
- Going through each of the qualitative and quantitative tools, question by question, with the qualitative enumerators and quantitative enumerators, respectively
- Role play on interview procedures

- Practice using tablets
- Q&A with enumerators
- Review of field protocols
- Assessment of enumerators.

All 82 enumerators (68 quantitative and 14 qualitative) were trained at the same time but were separated according to whether they are quantitative or qualitative. All the enumerators received all the aforementioned elements of training.

2.4.2 During data collection

Baseline data collection commenced on 7 May 2018 and ended on 6 June 2018. All data was collected concurrently irrespective of the methods (qualitative/quantitative). Due to many call-backs especially for the HHS, enumerators spent up-to three days for call-backs in each county to ensure the HHS are completed.

i. Protocols used during data collection

The following protocols were used during data collection:

1. Certificate of Good Conduct: Each of the enumerators had obtained a Certificate of Good Conduct from the Kenya National Police Service before being allowed to go the field.

2. Ethical and Child Protection Standards: The EE has in place a Child Protection Policy that ensures protection for children during program and research work. The enumerators were introduced to the Policy as part of their training. The Policy includes the following:
    - Child Protection Policy (CPP) statements: where our commitments and believes in relation to Child Protection are clearly and unequivocally stated, as a basis for our work and overall direction to all our staff and experts;
    - CPP Practices: where we describe the processes, procedures, abilities and related roles and responsibilities defined to ensure our commitments to the protection of children are met and upheld in our daily work;
    - CPP Management: where the procedures for our policy management (revision, distribution and dissemination, monitoring) are presented.
    - Having received training on Ethics and Child Protection, all the enumerators (and any other staff to be involved in the iMlango-T project evaluation signed the Child Protection Code of Conduct Form pledging to abide by the requirements therein.

3. Confidentiality Agreement Form: The enumerators also signed the Confidentiality Agreement Form in which they pledged to keep the information they come across for the participants confidential.

4. The safety of the enumerators was ensured by observing the following:
    - The enumerators were encouraged to leave the field before 5 pm to ensure they are in their meeting place for debriefing before dark
    - The enumerators worked two by two, mostly
    - They were encouraged to stay in the same hotels

ii. Sampling of Schools and Children

Sampling of Schools

We obtained a list of all the 270 schools that iMlango works with, including the control schools in the iMlango database. We then re-listed the schools by county and sub-counties. Using Probability Proportionate to Size (PPS), we calculated the numbers of schools needed per sub-county for each group. We then selected 118 schools by simple random from each sub-county thus: 52 from group A (and formerly C), 33 from group B; and 33 from group D.

Table 2-15 below shows total number of iMlango primary schools, stratified weighted sample sizes (weighted by county) of the primary schools required for the evaluation and the number of girls selected per Group for the learning cohort.

Table 2-15: Total number of iMlango primary schools, stratified weighted sample sizes

County	Group A (+C)		Group B		Group D		Total	
	Total Number	Selected	Total Number	Selected	Total Number	Selected	Total Number	Selected
Kajiado	16	**6**	10	**5**	4	**2**	30	**13**
Kilifi	52	**19**	28	**14**	17	**9**	97	**42**
Makueni	26	**10**	11	**7**	29	**14**	66	**31**
Uasin Gishu	46	**17**	16	**7**	15	**8**	77	**32**
Total	**140**	**52**	**65**	**33**	**65**	**33**	**270**	**118**
Girl sample per school	**33**		**33**		**33**		**n/a**	
Total	**1,716**		**1,089**		**1,089**		**3,894**	

Sampling of Children for the Learning Cohort

A database was obtained from sQuid (the implementing partner) with all the Grades 2, 6 and 7 pupils in the selected 85 groups A and B schools. From these lists, 33 pupils were selected, 11 from each of the three grades by using the random function in excel. For the 33 control schools, the team leaders used simple random method through the class registers to pick 11 pupils from the grades.

Sampling of Children for the Transition Cohort

The pupils to be in the transition cohort were selected from among the 11 in each grade (previously sampled from each grade, above) using simple random selection. The random function was used for the children in the database to select 7 each from Grades 2 and 6; and 8 from Grade 7.

iii. Assurance of Data Quality

The following measured were taken to ensure data quality:

- Having data quality runs daily to see the quality issues that would emerge e.g. problems with the digital platform, missing variables, typos, etc. The runs would show the enumerators involved and it therefore made it easier to address the issues directly.
- The Team Leaders were doing a checklist of the activities before exit from a school. This helped in ensuring meeting the targets as well as collection of quality data.
- During the weekend, all teams would meet to mark the SeGRA and SeGMA tests and the following was done for data quality checks.
- All the tests were shared among all the team members and no one was supposed to mark their own test.
- The teams marked one school at a time and this made work efficient.
- The data was entered using the same procedure to cross check the marks awarded by different enumerators and in case of any concern, the person who marked was consulted. This helped to avoid any bias.
- A systematic way of giving out and collecting the already marked tests to avoid misplacement of miss-up of the tests.
- After marking, all the tests were labeled and packed in boxes securely. Data synchronization was done every day depending on if there were software issues to be resolved.

- The data cleaning process was done in parallel to data streaming and the initial cleaning was completed some days before data analyses were completed.

For the qualitative data, the teams took time to code and serialize the recorded interviews as appropriate. Specifically, the qualitative data was transcribed from the recording devices into full interview scripts. NVIVO was used to code the data, and thematic analysis was conducted based on the key study questions. Powerful voices were identified and preserved as quotations to illustrate evidence during report writing.

iv. Final Sample Size for each instrument

Table 2-16 and

As shown in the Table 2-16, some of the planned sample sizes were not achieved and there was oversampling in a few cases. In the cases where the planned sample sizes were not achieved (learning tests, GSS and household surveys) the reasons for this included that some pre-sampled girls were not available and could not be replaced due to low population of girls in the class, where SeGRA and SeGMA tests were being done in the afternoon, some girls did not come back to school in the afternoon after lunch. With respect to the household surveys, the low rate was due to the vast distances that had to be covered by the FIs to access the respondents' homes, difficult terrain, tight data collection schedule (the FIs needed to visit one school per day and attempt to have all the quantitative and qualitative data collection completed; and in a few cases, there were refusals.

The oversampling in the observations was caused by some FIs observing some Group D Schools as well. This error was stopped once it was discovered. In the case of some schools that were later replaced (boarding schools), observations had already happened before the decision to not consider them as part of the sample.

Table 2-18 below show the final sample sizes achieved for each of the instruments based on the raw data-sets.

Table 2-16a: Final sample sizes for each of the instruments-Quantitative

Instrument	Respondents	Total (118 schools)			Kajiado (13 schools)			Kilifi (42 Schools)			Makueni (31 Schools)			Uasin-Gishu (32 Schools)		
		Expected	Achieved	%	Expected	Actual	%	Expected	Actual	%	Expected	Actual	%	Expected	Actual	%
EGRA	Grade 2,6,7	3,894	3,662	94.3	429	413	96.3	1,386	1,283	92.6	1,023	982	96.0	1,056	984	93.2
EGMA	Grade 2,6,7	3,894	3,706	95.2	429	424	98.8	1,386	1,294	93.4	1,023	987	96.5	1,056	1,001	94.8
SeGMA	Grades 6,7	2,596	2,484	95.7	286	281	98.3	924	875	94.7	682	666	97.7	704	662	94.0
SeGRA	Grades 6,7	2,596	2,460	94.8	286	281	98.3	924	855	92.5	682	676	99.1	704	648	92.0
GSS	Grades 2,6,7	3,894	3,964	101.7	429	442	103.0	1,386	1,402	101.2	1,023	1041	101.8	1056	1079	102.1
HHS	Girls in Transition Cohort *	2,596	2,129	82.0	286	247	86.3	924	743	80.4	682	617	90.5	704	522	74.1
Benchmarking for Learning	Grades 3,4, 8, F1	160	160	100.0	40	39	97.5	40	40	100	40	42	105	40	39	97.5
Benchmarking for transition	Group A and Group B HH	214	206	96.3	51	45	88.2	56	42	75	53	54	102	54	65	120
School Survey	Headteachers	20	16	80	5	5	100	5	4	80	5	2	40	5	5	100
Teacher Survey	Teachers (2 per school)	170	176	103.5	22	21	95.5	66	61	92.4	34	34	100	48	60	125.0
Classroom observations	Group B schools	33	41	124.4	5	5	100	14	11	78.6	7	16	228.6	7	9	128.6
Lab observations	Group A schools	52	56	107.7	6	5	83.3	19	18	94.7	10	13	130.0	17	20	117.6
Attendance Spot Checks	All Schools	118	97	82.2	13	13	100	42	38	90.5	31	18	58.1	32	28	87.5

Notes: * This represents the sample of girls who participated in the baseline study. However, some girls did not have data on certain

variables/indicators (missing data). A girl may miss some information on transition outcome variables but had information on other household survey variables. For exampale, Tables 3-4, 3-5 and 3-6 are based on all girls in the transition group who participated in the baseline; Tables 4-17, 4-18a and 4-19 are based on girls in the transition group who had complete information on transition outcome variables. This could explain differences in some statistics reported in various tables in this report; including those reported in the Outcome Spreadsheet.

Table 2-17b: Final sample sizes for learning instruments by grade-Quantitative

Instrument	Grade 2	Grade 6	Grade 7	Total
EGRA	1,244	1,222	1,196	3,662
EGMA	1,255	1,228	1,223	3,706
SEGRA	N/A	1,232	1,228	2,460
SEGMA	N/A	1,258	1,226	2,484
EGRA/ SeGRA	1,244	1,294	1,298	3,836
EGMA/SeGMA	1,255	1,312	1,303	3,870

As shown in the Table 2-16, some of the planned sample sizes were not achieved and there was oversampling in a few cases. In the cases where the planned sample sizes were not achieved (learning tests, GSS and household surveys) the reasons for this included that some pre-sampled girls were not available and could not be replaced due to low population of girls in the class, where SeGRA and SeGMA tests were being done in the afternoon, some girls did not come back to school in the afternoon after lunch. With respect to the household surveys, the low rate was due to the vast distances that had to be covered by the FIs to access the respondents' homes, difficult terrain, tight data collection schedule (the FIs needed to visit one school per day and attempt to have all the quantitative and qualitative data collection completed; and in a few cases, there were refusals.

The oversampling in the observations was caused by some FIs observing some Group D Schools as well. This error was stopped once it was discovered. In the case of some schools that were later replaced (boarding schools), observations had already happened before the decision to not consider them as part of the sample.

Table 2-18: Final sample sizes for each of the instruments-Qualitative

Tool	Baseline Sample	Achieved (%)
Headteacher KII	20 (10 A, 10 B) headteachers/deputies	100%
FGD protocol: board of management	36 (6 FGDS *6 pax)	100%
Classroom/lab observation tools	33 Whole Class; 52 Lab sessions	142.4%; 109.6%
FGDs protocols: boys	48 (6 FGDs*8 pax)	100%
FGDs protocols: girls	90 (10 FGDS*9 pax)	100%
FGDs protocols: teachers	54(6 FGDS *9pax)	100%
KIIs protocols with DEOs/CSOs/QAs	6(2 per community for 3 communities)	100%
FGDs protocols: mothers	27(3 FGDS*9 pax)	100%
FGDs protocols: fathers	12(2 FGDS* 6 pax)	100%
Interview protocol for parents receiving the stipend or microloan	12(2 per community for 6 communities)	100%

2.4.3 Post data collection

A data cleaning workshop was held with the data analysts, programmer and two of the field supervision staff. They ran frequencies of the key variables from the tools to see where there were missing data, typographical errors, duplication etc. These were corrected by looking at the hard and soft copies of the Learner Listing forms-mandatorily filled for every participant. Where necessary, the County Supervisors and/or Team Leaders were called on telephone to give clarifications.

Hard copy was kept under lock and key in secured data stores in APHRC with only key Project staff having access. Soft copy data are kept in password protected computers and folders. Unique Identification Numbers (UIN) were generated by the EE and included for each participant. The tools were then linked using the generated UINs. The analytic database was stripped of identifiers and the analyses done using STATA version 11. The analyses followed the requirements of the baseline report template.

For the qualitative data, the audio sets were listened to and compared with the raw transcriptions for accuracy and completeness. As is the case with quantitative data, soft copy data are kept in password protected computers and folders. The qualitative data and analysis were gathered and/or conducted through the following process:

- record the biodata of participants in hard copy during the interviews;
- record the interviews (audio files);
- convert the audio files to a word document (transcribe);
- code the transcripts into thematic areas;
- analyse what has been said in the various thematic areas of interest and include it in the report.

2.5 Challenges in baseline data collection and limitations of the evaluation design

This section provides a summary of limitations and challenges that were faced during the baseline evaluation (for both quantitative and qualitative aspects) either pre-fieldwork, during fieldwork, or post-fieldwork.

2.5.1 Risks and Risk Management Plan Before Fieldwork

Risk management involves the systematic assessment of possible risks to deliver of project results, the likelihood of the risk occurring; the identification of consequences from these risks; and the preparation of mitigating strategies to counter the risk occurrence, or the implementation of a response if it does occur. The approach to risk management should be clearly linked to the Theory of Change from which some / many risks may be identified.

Our approach to assessment of risk management is usually to review the extent to which the project's documentation captures such risks in a documented form such as a Risk Management Matrix (RMM).

A RMM identifies the risk and then assesses the following:

- The likelihood that it will occur (low, medium, high).
- The consequences should the risk become apparent (low, medium, high).
- Mitigation strategy for the risks to prevent them from materializing or address them once they do.

The RMM is reviewed and updated by Project Management on a regular basis. Assessment of risks and the mitigating strategies will thus involve an examination of the presence and quality of the risk analysis using the dimensions given above. The assessment will make sure that all realistic and pertinent risks have been captured and the appropriate mitigating strategies identified. It will also assess the regularity of RMM review and identify potential improvements to the risk management process.

The risks related to MEL that have been identified so far, including those specific to the delayed start of the baseline from January/February to March are presented in Table 2-19.

2.5.2 Limitations and Challenges faced during Fieldwork

The following challenges were manifested during the baseline fieldwork:

- **Inaccessible Roads:** Due to ongoing heavy rains in most parts of the country, some of the roads to target schools were impassable. In Kilifi, the vehicles carrying the FIs got stuck for a whole day before they could get help. In Uasin Gishu, the vehicle carrying FIs had to be towed by a tractor belonging to a farmer. In Kajiado, the FIs, including the Project Director who had gone for support supervision, spent the night in a Church building after unsuccessfully trying to maneuver through the muddy roads. The schools that were completely inaccessible were replaced.
- **School Closed:** Due to the flooding in parts of Uasin Gishu County, the pit latrine of one school, caved in on the day the school was scheduled for the interviews. MOE officials ordered the school to be closed and the school had to be replaced.
- **Boarding Schools:** Some of the schools pre-sampled for the study were either fully boarding or partial boarding. This meant that some of the pupils could come from areas beyond the vicinity of the school, sometimes from another County. Having such pupils participate in the study would have given invalid results and we had the FIs replace such pupils by randomly selecting others in the same grade. In some cases, the school would have to be replaced especially because of lack of enough numbers for the transition cohort. For instance, a school in Makueni County, had many of the parents living far away from Makueni. When schools were replaced, the replacement schools were chosen randomly (if the list had more than 1 available schools) but from the same Group (A, B or D) and from the same sub-county.
- **Household Surveys:** W hen the FIs went to the field, 2129 households responded to the Household Survey out of the expected 2596, representing 82.4% response rate. The low rate was due to the vast distances that had to be covered by the FIs to access the homes, difficult terrain and a tight data collection schedule. In order to complete the data collection exercise in time, the FIs needed to visit one school per day and attempt to have all the quantitative and qualitative data collection completed. In a few cases, there were refusals. The Project had to change the strategy in consultation with the Client and the Fund Manager whereby the Parents of the pupils would be requested to come to the school for the surveys to be done and be supported by the project for their fares. This strategy proved useful and the number of call-backs reduced significantly. The design factored in an attrition of 20% for households of girls in grades 2 and 6, and an attrition of 30% for households (HH) of the 7th graders. A response rate of 82% is still within the acceptable response rate though it is approaching the borderline. To mitigate this, the EE will trace the HH that were not reached at baseline for interview at midline and endline (they will have two data points); allow more time during midline/endline data collection for HH follow-ups, and have a dedicated team of enumerators for follow-ups. To address the HH sample loss at Baseline, the sample are to be topped up by adding additional respondents to ensure the required sample is achieved at ML.
- **Inconvenience to Parents:** As a result of the change of strategy mentioned above, there were cases when parents were kept waiting longer than anticipated in one school as enumerators travel from another school, especially when dealing with call-backs. Such a case was witnessed in Makueni county, in a group D school. If parents in one school were delayed to it affected the start of HHS in the next school to be visited by the enumerators creating the domino effect. Though such cases were not so common, with regards to the school in Makueni that was affected, the field team has sent an apology to the Headteacher and parents. The project management asked the Team Leaders to ensure that their planning included room for contingencies. The Client was also informed, from a different source, about this isolated incidence and reported it to the EE for corrective action.
- **Quantitative Enquiry:** For qualitative data collection, there were no limitations introduced by the approach taken. Qualitative data was collected in the schools/communities on the same day as the

quantitative data for logistical reasons but by the different set of FIs. The Quantitative FIs managed to interview or have discussions with all the expected number of participants.

2.5.3 Methodological Challenges to the Evaluation Approach

One of the methodological challenges we encountered in the field was that some pre-sampled pupils were not in class. We had obtained a database of all the Grade 2, 6 and 7 intervention schools from sQuid Kenya and used the lists to pre-sample by simple random sampling of names of 85 intervention schools. This was followed by simple random sampling of names of 33 girls, for the learning cohort (a total of 2805), in each of the schools and 22 girls (a subset of the 33) for the transition cohort (a total of 1870). Control schools were selected through matching with the treatment schools by sub-county they belonged to, and then 33 girls were randomly selected from each school, 11 girls from each of grades 2, 6 and 7. In total, we target 3894 school girls. When the FIs went to the field, there were cases where some of the pre-sampled pupils were not found in the classes. In most cases, the pupils had either transferred to other schools or repeated class, which indicated that the discrepancies observed might be linked to the sQuid Kenya database not being updated to account for the new and transferred students. In one isolated case, the entire list of names of pupils provided belonged to another school – this could be an administrative issue on record keeping. In these cases, the Team Leaders had to go back to class and pick replacement pupils by simple random selection. Similarly, girls who were on the list but absent during the day of data collection were replaced. The EE insisted on only the Team Leaders (who had been thoroughly trained in selecting participants) doing the replacement in order to reduce potential bias. A caveat will however be provided that the participants were sampled at different times. That is, some of the participants had been pre-sampled while others, as mentioned above, were sampled during the data collection process. This includes the girls in schools that had to be replaced during the data collection process. EE kept a list of the students interviewed in each school including information identifying whether the interviewed student was in the original sample or a replacement. As seen from the table below, on average, about one in every five girls from the learning cohort was replaced, while almost one in every three girls in the transition cohort was replaced.

	Kajiado		Kilifi		Makueni		Uasin Gishu		Total	
	n		n		n		n		n	
Learning cohort (%), N=3964	97	(2.5)	327	(8.3)	184	(4.6)	236	(6.0)	844	(21.3)
Grade 2 (%), N=844	26	(3.1)	88	(10.4)	53	(6.3)	61	(7.2)	228	(27.0)
Grade 6 (%), N=844	39	(4.6)	110	(13.0)	61	(7.2)	77	(9.1)	287	(34.0)
Grade 7 (%),N=844	32	(3.8)	129	(15.3)	70	(8.3)	98	(11.6)	329	(39.0)
Transition cohort (%), N=2129	100	(4.7)	220	(10.3)	98	(4.6)	167	(7.8)	585	(27.5)
Grade 2 (%), N=585	28	(4.8)	46	(7.9)	27	(4.6)	43	(7.4)	144	(24.6)
Grade 6 (%), N=585	28	(4.8)	71	(12.1)	28	(4.8)	57	(9.7)	184	(31.5)
Grade 7 (%), N=585	44	(7.5)	103	(17.6)	43	(7.4)	67	(11.5)	257	(43.9)

Having the caregivers of the pupils come to the school for HHS meant that the FIs could not verify the answers given by the caregivers to questions related to the house e.g. the type of dwelling (PCG_1econ) and the type of roofing material used for the house (PCG_2econ). While we believe this aspect should be caveated, we think it does not affect the robustness and reliability of the findings as the poverty level of the households as it affects the girls' attendance and progression in school is measured with other questions in the HHS tool including PCG_5 and PCG_7 that asks about the occupation of the Carer and whether there is difficulty in affording for the girl to be in school.

Table 2-19: Risk Register for iMlango External Evaluation

Risk description	Risk Probability	Risk Impact	Risk Rating	Mitigation
Evaluation cohort sample size too small/attrition too high by Endline	Medium	High	High	Allow for a larger attrition rate of the sample between Baseline and Endline – 20% has been assumed for iMlango-T which is twice as much from iMlango-1. Plan in the event of low number of pupils in school on test day. Advance notice of exam day for kids to be present. The protocols are to be put in place that specify the number of re-visits that need to be attempted before replacement of student. Additionally, the sample size are to be revisited by adding additional students to ensure that in situ toping up is the mehanizm used as a the last resort.
Delay in receipt of ethical approval letter	Low	High	Medium	Expedited review requested and paid for.
Reluctance of schools (esp. control schools) to take part in the evaluation	Medium	Medium	Medium	Ensure that clear communication starts as early as possible with the relevant authorities as well as with headteachers of the control schools. Ensure that a replacement strategy is in place if any school or community cannot or will not take part in the research. Involve project team throughout planning and field logistics for evaluation. Keep contact numbers of key authorities. Ensure early communication from project to schools.
Lose track of evaluation girls between Baseline and Midline/Endline	Low	Medium	Medium	Mark girls in system so we're aware of transfer/drop-out, giving us greater awareness of attrition rate prior to evaluation
Too few (non-Midline/Endline) assessments capturing termly academic progress	Low	Low	Low	Either leverage existing termly assessments done in school, or issue termly numeracy and literacy assessment through the portal
Overburden pupils and teachers with additional iMlango assessments	Medium	Medium	Medium	Ensure assessment process is as short and smooth as possible; not arduous for pupil nor teacher. Leverage assessments as a source of logframe data as well, avoiding further questionnaires/surveys.
Insufficient time to carry out Baseline	High	High	High	Discussion with FM over extension for Baseline submission. Additional enumerators required to accelerate field work
Delay in field work	High	High	High	Ensure field visit schedule accounts for adequate time at each school (no extra days due to late start of baseline). Additional enumerators required to accelerate field work
Field team loses members (illness, drop-out)	Low	Medium	Medium	Hire and train with margin of extra 1-2 enumerators per county.

Risk description	Risk Probability	Risk Impact	Risk Rating	Mitigation
An enumerator breaches confidentiality and discloses personal details of a child participating in the evaluation	Medium	High	High	Train the staff involved and re-train, clarify the risk on this aspect prior to each reporting episode.
Child assent for participation in the evaluation is not obtained	Medium	Medium	Medium	Review all the assent and informed consent forms. All staff involved will need to sign the Child Protection Policy/Code of Conduct and Confidentiality Agreement Forms provided by the EE.
Parental consent for a child's participation in the evaluation is not obtained	High	High	High	Create buy-in among the parents by communicating the goals of the project early enough
Child protection breach during girls' and boys' participation in evaluation research	Medium	High	High	The Child Protection Policy is in place and being followed by EE and by project teams. Child safeguarding is a high priority, and extensive guidance to field teams has been provided in advance of contact with children. The project's ethics guidance around research with children is being followed.
Delay in final approval and sign-off on tools, due to late changes/ communication in design	Medium	High	High	Prior communication among project team, FM and EE Additional enumerators required to accelerate field work
External/weather-related risks (delayed baseline to March 2018, start of rainy season)	Medium	High	High	Prior communication among project team, schools, FM and EE. Position enumerators close to schools one day in advance (but also avoid stressing field interviewers with constant movement). Additional enumerators required to accelerate field work. Close monitoring of local conditions. Factor schedule changes in school visits (switching dates) if schools can accommodate. Consider options such as repeat visits to some schools in Term 2 (May 2018) or schedule time in Term 2 (May 2018) for baseline.
Unforeseen analytical demands from the FM	High	High	High	Receive data analytical requests early enough; and especially at the point of developing and/or revising the work plan for a phase.
Insufficient resources to deliver the evaluation on time	High	High	High	FM and Avanti to provide full information on expected deliverables that could inform adequate costing of resource inputs.

3. Key Characteristics of Baseline Samples

3.1 Project beneficiaries

As mentioned in Section 1, the marginalisation definition in the context of the iMlango-T project is as follows:

Educational marginalisation
The main drivers the project perceives for educational marginalisation are:

- Poor attendance: even though the data from iMlango-1 shows that average attendance is around the level of 82%, there are groups of girls and boys with consistently lower attendance levels. This affects their chances for learning and their educational outcomes.
- Poor quality of teaching and materials: this is one of the main drivers for poor learning outcomes as teachers have gaps in their teaching practices and often they do not have the appropriate resources to ensure that all students in their classes are learning and progressing.
- Large class sizes: this is another element that makes teaching harder in the iMlango schools as many of the classes have more than 70 students attending.

The project estimates that overall 58% of the girls in the iMlango schools are educationally marginalised.

Economical marginalisation
From iMlango 1 baseline the project has confirmed that the communities around the iMlango schools experience high percentages of poverty which has an impact on school attendance. Poverty has sometimes been linked to inability to pay school fees, lack of food, sanitary towels and other goods that are necessary for the students to attend school and learn.

The project estimates that overall 50% of the girls in the iMlango schools are economically marginalised.

Social marginalisation
A number of issues can lead to this type of marginalisation such as FGM, early pregnancies, gender stereotypes regarding girls' education and lack of aspiration for the girls to continue with their education.

The project estimates that overall 40% of the girls in the iMlango schools are socially marginalised.

The project recognises that girls might be affected by one or more types of marginalisation at the same time and therefore all girls attending the iMlango primaries are considered direct beneficiaries of the project. At early planning stages, the inclusion of boys in this study was considered but this plan was later abandoned because of limitations of funds for the evaluation. However, boys were retained in the qualitative aspect of the evaluation.

3.2 Representativeness of the learning and transition samples

Table 3-1 to Table 3-4 present the breakdowns of the evaluation sample by geographical location (county), student grades, student age, and disability, respectively. Table 3-1 shows the learning cohort that had a total of 3,964 girls out of whom 2,866 and 1,098 were in the intervention and control groups, respectively. The table further show that Kilifi with 1,402 girls had the largest share of the girls in the intervention cohort while Kajiado with 442 had the smallest share.

In regards to breakdown of the sample by grade, Table 3-2 shows that a vast majority of the girls in both learning and transition cohorts were in upper primary school grades (Std. 6 & 7). On the other hand, Table 3-3 shows that a considerable number of the girls in the learning cohort were 13 years of age or below and

this was expected because these are primary school girls. In terms of disability, Table 3-4 shows the number of girls in the transition cohort (intervention and control) who had some form of disability. Results show that, for each category of disability, the proportions in the intervention and control groups did not differ much – indicating existence of baseline balance between the intervention and the control. However, in terms of those reporting serious illness, the proportion of girls in the control group (14%) was noticeably lower than in the intervention group (16.5%).

Table 3-1: Evaluation sample breakdown by county

	Learning Cohort			Transition Cohort		
	Sample size	Intervention (%)	Control (%)	Sample size	Intervention (%)	Control (%)
Kajiado	442	84.8%	15.2%	247	91.9%	8.1%
Kilifi	1402	79.2%	20.8%	743	78.3%	21.7%
Makueni	1041	54.5%	45.5%	617	51.4%	48.6%
Uasin Gishu	1079	75.4%	24.7%	522	76.4%	23.6%
Sample size (n)	**3964**	**2,866**	**1,098**	**2,129**	**1525**	**604**

Table 3-2: Evaluation sample breakdown by grade

	Learning Cohort			Transition Cohort		
	Sample size	Intervention (%)	Control (%)	Sample size	Intervention (%)	Control (%)
Grade 2	1,306	72.1%	28.0%	675	71.3%	28.7%
Grade 6	1,331	72.4%	27.6%	688	70.9%	29.1%
Grade 7	1,327	72.4%	27.6%	766	72.6%	27.4%
OOS girls	N/A	N/A	N/A	N/A	N/A	N/A
Sample size (n)	3,964	2,866	1,098	2,129	1525	604

Table 3-3: Evaluation sample breakdown by age

	Learning Cohort			Transition Cohort		
	Sample size	Intervention (%)	Control (%)	Sample size	Intervention (%)	Control (%)
Aged 6-8	772	71.6%	28.4%	409	69.7%	30.3%
Aged 9-11	731	71.8%	28.2%	390	71.5%	28.5%
Aged 12-13	1,427	72.9%	27.1%	794	71.0%	29.0%
Aged 14-15	747	71.0%	29.1%	408	74.3%	25.7%
Aged 16-17	155	72.3%	27.7%	71	67.6%	32.4%

	Learning Cohort			Transition Cohort		
	Sample size	Intervention (%)	Control (%)	Sample size	Intervention (%)	Control (%)
Aged 18-19	24	54.2%	45.8%	11	81.8%	18.2%
Aged 20+	108	86.1%	13.9%	46	80.4%	19.6%
Sample size (n)	**3,964**	**2,866**	**1,098**	**2,129**	**1525**	**604**

Section 3.1 presents information on the distribution of the sample by study group grade, age and county. The sample appears to be fairly well distributed across these attributes though heavily leaning towards the treatment arms. Probably this could be justified by the fact that treatment arms were more than one (A+C, and B). Though showing such distribution is necessary, it is not sufficient to determine full representativeness of the wider beneficiary. Such distribution should be viewed in the context of the power calculations presented in Section 2.4.1, and sampling procedures that allowed PPS and simple random sampling at all stages starting from sub-county going down to classroom. It should also be noted that the evaluation design allows effect of iMlango to be detected at the program level and not at subgroup levels.

Table 3-4: Evaluation sample breakdown by disability (transition cohort)

Sample breakdown (Girls)	Intervention (Transition) n = 1525	Control (Transition) n = 604	Var Name
Girls with disability (% overall)	3.0% (46)	2.7% (16)	N/A
Vision impairment	0.8% (12)	0.8% (5)	PGD_Ov12_1
Hearing impairment	0.9% (14)	0.8% (5)	PGD_Ov12_2
Mobility impairment	0.1% (2)	0.2% (1)	PGD_Ov12_3
Cognitive impairment	0.7% (11)	0.7% (4)	PGD_Ov12_4
Self-care impairment	0.3% (5)	0.2% (1)	PGD_Ov12_5
Communication impairment	0.5% (8)	0.5% (3)	PGD_Ov12_6
Girl had any serious illnesses[29]	16.5% (251)	14.0% (84)	PGD_Ov12_6

[29] The item asked was "In the last year, has [GIRL] had any serious illnesses?" This left the interpretation of 'serious illness' to the respondent. For instance, if the girl had a common cold that prevented her from attending school, that could pass for a serious illness to one respondent and not a serious illness to another. Hence a considerably high proportion of serious illnesses.

3.3 Educational Marginalisation

Selected characteristics of the girls in the learning cohort are shown in Table 3-5. Thus, incidences of double orphans were in the range of 0.4% among the control group to 0.6% among the intervention group, which means that a vast majority of the students had at least one parent. However, the percentages of girls living with both parents were surprisingly small for both intervention and control group (about 4.6% for both groups). It is surprising because these communities are largely rural with one in every five primary caregivers having no formal schooling, hence less likely to move out of the rural areas. However, it would seem that at least one parent is away and this could be attributed[30] to search for employment income, especially casual work, away from the domicile, and perhaps preference for boarding/living away to safe on transport costs. This could be the case in Kilifi, Makueni and Uasin Gishu. In Kajiado, absentee parent may be attributable to cattle herding where men walk far with their cattle in search of pasture – at the time of data collection, the region was coming out of a very dry spell. Percentages of those living in female head household in the intervention (28.2%) and control (30.1%) groups did not differ much – an indication of baseline balance. About one-half of the girls in the intervention (about 50.0%) and control (about 52.5%) groups came from households that had difficulties affording to send them to schools. This could imply that about half of the girls in the project could be called upon to contribute to unpaid family labour, especially household chores, and this could jeopardise regular school attendance. Moreover, about four out of every five girls (80.7% and 82.6% for intervention and control group respectively) in both groups had mother tongue that was different from the language of instruction, while 23.4% and 14.8% of the girls had primary caregiver with no formal education.

From Table 3-5, about 30% of girls lived in female-headed households and only 5% indicated they lived with both parents. By implication, almost 70% of girls lived in male-headed households. In our context, living in a 'male-headed household' should not always be interpreted that the father (or the male head) is available most of the times. In most African rural communities, fathers remain the heads even when physically absent, hence their obligation to regularly send remittances back home. It is possible that this is how this data can be interpreted. The high penetration of mobile telephony and mobile money in Kenya acts to support such arrangements.

Table 3-5: Girls' characteristics

	Intervention (Baseline) (n=1525)	Control (Baseline) (n=604)	Source (Household and Girls School survey)
Sample breakdown (Girls)			
Orphans (%)			
Single orphans	22.4 (no mother)	15.9 (no mother)	PCG_10g
	34.1 (no father)	28.0 (no father)	PCG_13g
Double orphans	0.6 (both parents absent)	0.4 (both parents not alive)	Single-Either=2; Double-Both var=2
Living without both parents (%)	4.6	4.6	PCG_10g;PCG_12g; both Var=5
Living in female headed household (%)	28.2	30.1	HH_8=2
Married (%)	0.1	0.0	PCG_22g=1
Mothers (%)	0.2	0.0	PCG_23g=1 & HH_15<16 or HH_15<18
Poor households (%)			

[30] See respective county CIDPs in the following site: https://cog.go.ke/downloads/category/82-county-integrated-development-plans-2013-2017

	Intervention (Baseline) (n=1525)	Control (Baseline) (n=604)	Source (Household and Girls School survey)
Difficult to afford for girl to go to school	49.9	52.5	PCG_7enr=1
Household doesn't own land for themselves	25.4	16.6	PCG_11econ=4
Material of the roof (material to be defined by evaluator)	See Figure 3-1	See Figure 3-1	PCG_2econ - all
Household unable to meet basic needs	26.5	25.1	PCG_5econ
Gone to sleep hungry for many days in past year	18.7	15.8	PCG_7econ
Language difficulties (%)			
LoI different from mother tongue	80.7	82.6	PCG_2enr
Girl doesn't speak LoI	4.1	3.1	PCG_3enr=3
Parental education (%)			
HoH has no education	17.0	9.4	HH_13
Primary caregiver has no education	23.4	14.8	PCG_6

The proportion of girls who were married or mothers is negligible (below 0.3%), though counties such as Kilifi are known to have high rates of teenage pregnancy, with over 13,000 cases of girls aged 15-19 years and 290 cases of girls aged 10-14 years, reported by the county health department this year (Wanje, 2018)[31]. The mean age of girls in the transition cohort was 12.4 years while the median was 12 years – hence partly explaining this low proportion as young girls are less likely to be mothers or married. Kilifi is known to have young mothers, and given the high poverty rates, there is a high chance that those who get pregnant or married drop out of school, hence were not captured in the school-based sample of girls.

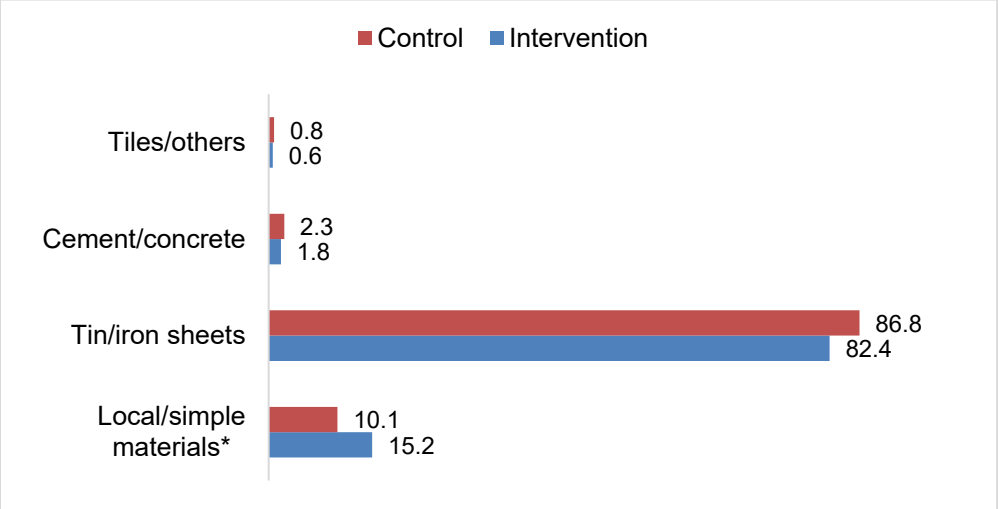


Figure 3-1: Distribution of roofing materials by study group

[31] Wanje, Z. (Nov 2018). Shock as 13,000 school girls fall pregnant in Kilifi this year. Citizen Digital. Available at https://citizentv.co.ke/news/shock-as-13000-school-girls-fall-pregnant-in-kilifi-this-year-217639/

3.3.1 Barriers

Table 3-6 shows results for barriers to learning and transition for both the learning cohort the transition cohort. In regards to barriers at home or at community level, about 9.3% and 12.6% of the primary caregivers interviewed in the intervention and control groups, respectively, reported fairly unsafe or very unsafe travel to school in the area. Example is when the girls find it insecure to go very early to school in the morning passing through maize fields without escort. Safety during walk to school (WTS) were evident among parents but not among the girls. Literature associates such safety concerns with traffic speed, pathways and crossing safety (Oluyomi, 2014)[32]. In the project's context that is largely rural, the parental concerns regarding girls safety could have emanated from potential chance of being lured by a '*boda boda*' riders, and encounter with stray wild animals and availability of peers to walk with. On the other hand, girls may not perceive this as risky due to their interpretation of safety. For instance, while mothers see a free ride by a '*boda boda*' rider as risky, the girl could view it as support to get to school in good time.

At the school level, there were only a few incidences of girls attending school less than half the time in both groups – meaning that non-school attendance may not be a key barrier to learning and transition. However, incidences of other barriers, such as lack of computer for use by students at schools, language of instruction different from mother tongue, and household difficult in affording girl to go to school, were noticeably common among intervention and control groups, an indication that these could be key barriers to learning and transition. Girls lacking full knowledge (from either parents or teachers) of sanitary pads usage and how to manage their bodies at such times are often too embarrassed to attend classes.

Table 3-6: Potential barriers to learning and transition

Barriers	Intervention (Baseline)	Control (Baseline)	Source[33]
Sample* breakdown (Girls)			
Home – community			
Safety:			
Fairly or very unsafe travel to schools in the area (%)	9.3% (142)	12.6% (76)	PCG_9
Doesn't feel safe at school (%)	1.5% (42)	1.5% (16)	CS_W14s
Parental/caregiver support:			
Insufficient time to study: High chore burden (evaluator to specify threshold, %). High=½ day or more.	5.4% (83)	3.3% (20)	PCG_26g
Doesn't get support to stay in school and do well (%)	2.0% (56)	2.4% (26)	HHG_7
School level			
Attendance:			
Attends school half the time (%)	0.3% (4)	0% (0)	PCG_6enr
Attends school less than half time (%)	0.6% (9)	0.3% (2)	PCG_6enr
School facilities:			

[32] Oluyomi, A. O., Lee, C., Nehme, E., Dowdy, D., Ory, M. G., & Hoelscher, D. M. (2014). Parental safety concerns and active school commute: correlates across multiple domains in the home-to-school journey. The international journal of behavioral nutrition and physical activity, 11(1), 32. doi:10.1186/1479-5868-11-32.

[33] Variables starting with 'P' or 'H' are for transition cohort; while those starting with 'C' are for the learning cohort.

Barriers	Intervention (Baseline)	Control (Baseline)	Source[33]
No seats for all students (%)	8.3% (239)	12.6% (138)	CS_W5s
Difficult to move around school (%)	3.6% (102)	3.7% (41)	CS_W6s
Doesn't use drinking water facilities	9.9% (283)	11.5% (126)	CS_W7s
Doesn't use toilet at school	0.2% (5)	0.4% (4)	CS_W9s
Teachers:			
Disagrees teachers make them feel welcome	2.6% (75)	2.4% (26)	CS_WA
Agrees teachers treat boys and girls differently in the classroom	14.1% (403)	9.5% (104)	CS_1s
Agrees teachers often absent from class	17.3% (495)1	16.6% (182)2	CS_2s
HH Economic marginalization:			
Difficult to afford for girl to go to school	48.4% (738)	51.3% (310)	pcg_7enr
HH unable to meet basic needs	26.2% (400)	24.8% (150)	pcg_5econ_i
Ever gone to sleep feeling hungry many/ most days	24.9% (380)	21.0% (127)	pcg_7econ
Gone without clean water many / most days	17.8% (272)	17.4% (105)	pcg_8econ
Gone without medicines/medical treatment many/ most days	17.4% (266)	17.2% (104)	pcg_9econ
Gone without cash income many/most days	55.9% (853)	60.4% (365)	pcg_10econ
Does not own any land	25.1% (382)	16.7% (101)	pcg_11econ
Difficulties in Child functioning:			
Difficulty seeing	0.8% (12)	0.8% (5)	pgd_ov12_1
Difficulty hearing	0.9% (14)	0.8% (5)	pgd_ov12_2
Difficulty walking	0.1% (2)	0.2% (1)	pgd_ov12_3
Cognitive difficulty	0.7% (11)	0.7% (4)	pgd_ov12_4
Difficulty self-care	0.3% (5)	0.2% (1)	pgd_ov12_5
Difficulty communication	0.5% (8)	0.5% (3)	pgd_ov12_6
has had serious illness	16.5% (251)	14.0% (84)	pgd_ov12_7
Language difficulties:			
LoI different from mother tongue	78.5% (1,197)	81.1% (490)	pcg_2enr
Girl doesn't speak LoI	3.2% (49)	2.5% (15)	pcg_3enr

Notes: *(1) N for intervention group: PCG_ & PGD_ =1525; CS_ & HHG_ = 2866; (2) N for control group: PCG_ & PGD_ = 604; CS_ & HHG_ = 1098

Parental perceptions regarding the quality of teaching received by the girls as well as changes in teaching quality were collected. In total, less than 3.5% of the 2129 parents interviewed perceived the quality of teaching received by the girls to be poor or very poor while only about 3.9% of these parents perceived teaching quality to have gone down in the last 12 months – meaning that teaching quality was not perceived as a barrier to learning. Data on teaching and learning materials were not collected at baseline. Data on access to textbooks and T&L materials were not collected at baseline, and so it is not possible to examine if these items are potential barriers. No qualitative data has been found that could help to explain why the 2% of the cohort does not feel safe at school. This theme would be investigated in more detail at the Midline evaluation point. However, in an IDI with a parent who is stipend beneficiary in Uasin Gishu, the parent spoke of it being unsafe for the girls to go to school very early when the maize plants are tall.

3.3.2 Other barriers identified through qualitative data analysis

The HHS data agrees with the qualitative data on certain variables including: early marriages, poverty leading to inability to pay school charges, and the household chores burden. Through the FGD conducted with girls and with boys, KII with head teachers, FGD with BOMs, KII with Chiefs; and IDI with parents who received stipends, the barriers spoken of by the discussants and interviewees include: girls getting into relationships with boys and men, economic challenges, cultural norms against educating girls, lack of sanitary products; parents giving chores to the girls, insecurity, distances to schools as shown below:

(a) Girls getting into relationships with boys and men

Several participants in FGDs in Kajiado, Kilifi and Makueni counties cited girls getting into relationships with boys and men as a hindrance to girls remaining in school. These include a member of a school BOM in Kajiado who went as far as suggesting that girls should be in boarding schools to deal with this problem. Similar sentiments about relationships with boys being a challenge in keeping girls in school was expressed by a young mother in Kilifi during a FGD. A girl participating in FGD in Kajiado also mentioned that sometimes boys ''disturb'' girls and make them not want to be in school any more as shown in the quote below,

"Boys really…. first of all, they disturb, sometimes they tell you they have a crush on you, and it's like a must…. they use it to get in a relationship. Now, you have that feeling that you are not perfect for school" (Kajiado FGD Girls).

Three girls in separate FGD in Kilifi felt that the girls are to be blamed as they are the ones who want to pursue these relationships despite their parents' readiness to pay school fees. One of the girls spoke of the girls in her primary school attending ''disco matanga'' (dancing at night during funerals). Disco matanga was also mentioned as an avenue through which the girls meet with the boys by a young mother participating in a FGD in Kilifi. Regarding girls pursuing the relationships, one girl put it explicitly as shown below:

''These girls……(long silence) when they are in school, they may drop out of school because they are either with boys or they leave school and go to meet boys, they spend their nights at the boys' place and the next day they will not come to school. That will continue like that and eventually they will drop out of school because of pregnancy''

A headteacher in Uasin Gishu spoke of girls getting into relationships with "boda boda'' (motorcycle) riders and getting pregnant by the men in a Key Informant Interview. Girls getting into relationships with the motor cycle riders was only mentioned by the head teacher in Uasin Gishu. During the interview. he described the boda boda riders as a big problem in his area about which he has even raised the issue with the area chief.

While there are other factors, it seems that girls getting into relationships with boys and men does contribute to poor attendance and low completion rates of primary schools. According to Kenya Primary Education Profile Report, 2012, the girls' completion rates in Kilifi and Kajiado respectively are 42% and 46% compared to boys' 72% and 56% in the same counties. Most respondents who spoke of girls getting into relationships with boys as a challenge came from the two counties.

(b) Culture and attitude on educating girls: Incidences of parents forcing the girls to early marriages came up during FGD with girls and FGD with boys in Kilifi and Kajiado, respectively.

Challenges related to culture: parents forcing the girls to early marriages were mentioned during FGD with BOM in Kajiado, 2 FGD with Boys in one in Kilifi and another in Kajiado; FGD with girls in Makueni'; FGD Boys in Makueni; and in two different FGD with Teachers in Uasin Gishu.

In a FGD with boys in Kilfi, one boy said: *"There are challenges that girls face for example some parents discriminate their daughters in the sense that this girl might be interested in learning but the parent forces her into early marriage*".

(c) Economic challenges

Economic challenges were mentioned as contributing to non-attendance of girls in schools by participants across all counties. In Kilifi, it was highlighted in 2 FGD with girls, one FGD with boys, and in one FGD with teachers. In Kajiado, 2 young mothers' during FGD spoke of poverty as a challenge. In Makueni, this was mentioned by one discussant in FGD with girls and in one FGD with BOM. In Uasin Gishu, in two FGD with teachers, it was expressed that girls give up in continuing with their education due to lack of money to pay school fees.

In an FGD with girls in Kilifi, one girl said,

''*Maybe there is no money at home and you have been sent away from school, your uniform is worn out, you don't have shoes and you have to walk barefoot, so some decide to go and get married"*

Poverty was also mentioned most frequently as a barrier with 10 interviewees among IDI with parents who received stipends. These included: 2 from Kajiado, 3 from Kilifi, 3 from Makueni and 2 from Uasin Gishu who mentioned inability to pay fees and lack of basic necessities in life as contributing to keeping girls in school. One IDI Parent from Kilifi said,

''*In our area here, income for most parents here is very low and many a time children are sent back home due to lack of fees. Some parents are not capable at all and you find that when this child goes back home and finds nothing he remains at home"*

(d) Lack of sanitary products:

Lack of sanitary towels were mentioned as a challenge during two FDG with girls in Kajiado, FGD with BOM in Kilifi and in a FGD with BOM in Uasin Gishu. One girl in Kajiado said that the challenge is big in her class,'' *First there is a thing that usually challenge girls….the monthly periods. Especially when it starts in class, you are sited in class, and maybe you are seated around boys. Now you will be shy. They have come, should I just sit down. It usually challenges and you see when you have been send home, you will be going like thinking, "Am not actually that important, that's why I was even being sent home…why does it have to happen to me right now?' It's usually a challenge to most girls especially…let me just say it, especially to our class"*

In another FGD girls in Kilifi, one girls said, *''They are like when you have that period, you sit down and you wake up, your skirt is tainted. And when you stand up without knowing, a boy just calls you, "you have blood on your skirt". You will feel like, "oh God, they know!" You run to the teachers, to the deputy headteacher's office, you tell her to help you with pads. And then you go and change you see like, "when I go to that class, everybody will be looking at me". You come when you are hiding your face, you are looking down. When you go home you are like thinking, "should I come to school tomorrow?' (FGD Girls, Kajiado).*

(e) Parents giving chores to girls

In Kilifi and Uasin Gishu, several participants mentioned parents giving chores to girls at home as a challenge to keeping the girls in school. This was during FGD with girls in Kilifi in which one girl spoke of girls being asked to stay home and sell alcohol; IDI with parent who has been receiving stipends in Kilifi, two FGD with BOM in Kilifi where one BOM member said that some parents think of kitchen work as more important for girls than being at school this was mentioned too in the FGD girls in Uasin Gishu. A parent spoke of a child being told to go and graze (cattle) and not go to school because the parent has gone to the market (IDI Parents, Kajiado).

In a FGD with teachers in Uasin Gishu, one teacher said: *"When you come to girls' absenteeism, maybe the girls are absent at home when the mother wants to go looking for some money, the first person to be chosen to stay at home is the girl child"*

One member of a BOM in Kilifi had this to say: *"Child labor, it's free time right? You find that a girl who is in class seven or six is the one taking care of the house. Now if this iMlango is part time, when it's 4:00 on the dot, she is already going home thinking how she will go…her mother will not be there, maybe she will go to fetch water or cook for others"*

(f) Insecurity

In an IDI with a parent who is stipend beneficiary in Uasin Gishu, the parent spoke of it being unsafe for the girls to go to school very early when the maize plants are tall.

(g) Distances to school.

Long distances to school was mentioned as a barrier by three participants all of them in Uasin Gishu County: 2 in different FGD with BOM and one a chief in a KII Chiefs. One BOM member said, *''One, of course we know girls have many challenges but we are not resenting the boys also. You know the girls face the challenges, maybe walking from long distances and of course this is a direct challenge for the girls"*

3.4 Intersection between key characteristics and barriers

Results for intersection between key characteristics and the barriers to learning and transition are given in Table 3-7 and Table 3-8. We have used a cut-off of 10% for a variable to be included as a barrier. From this table it can be seen, for example, that a notable proportion of girls who did not have sufficient time to study because of household chore burden were from poor households (36.6%), and were in the age group of 12-13 years (37.9%). Likewise, a notable proportion of the girls who did not get support to stay at school were from poor households and also in the age group of 14-15 years. Furthermore, once data was disaggregated by county (Table 3-9) and after filtering off non-applicable cases, insufficient time due to heavy household chore burden remained a barrier, with 42, 33 and 22 (absolute numbers) girls mentioning it from Kilifi, Uasin Gishu and Makueini, respectively.

Table 3-7: Barriers to education by characteristic (HHS)

Barriers	Characteristics		
	Head of the household has no education (HH_13=0)	Main LOI different from language at home (PCG_2enr)	Household is poor (PCG_7enr=1)
Parental/caregiver support			
Insufficient time to study because of high chore burden i.e. High=½ day or more (PCG_26g=1,2,3)	16.8 % (17)	77.7% (80)	36.6% (37)
Doesn't get support to stay in school and do well	21.7% (10)	81.8% (36)	59.1% (26)
School Level			
Disagrees teachers make them feel welcome (CS_WA)	22.5% (11)	77.8% (35)	41.3% (19)
Individual level			
Orphanhood:	10.5% (2)	25.0 (5)	6.3 (1)

Barriers	Characteristics		
	Head of the household has no education (HH_13=0)	Main LOI different from language at home (PCG_2enr)	Household is poor (PCG_7enr=1)
Double orphan (both parents not alive)			
Safety: Doesn't feel safe at school (cs_w14s)	32.3% (10)	77.4% (24)	71.0% (22)

Table 3-8: Barriers to education by age categories

Barriers	Age groups						
	6-8	9-11	12-13	14-15	16-17	18-19	20+
Parental/caregiver support							
Insufficient time to study because of high chore burden i.e. High=½ day or more (PCG_26g=1,2,3)	12.6% (n=13)	23.3% (n=24)	37.9% (n=39)	14.6% (n=15)	4.9% (n=5)	N/A (n=0)	6.8% (n=7)
Doesn't get support to stay in school and do well	15.9% (n=13)	22.0% (n=18)	22.0% (n=18)	28.1% (n=23)	9.8% (n=8)	N/A (n=0)	2.44% (N=2)
School Level							
Disagrees with teachers make them feel welcome (CS_WA)	26.7% (n=27)	23.8% (n=24)	30.7% (n=31)	11.9 % (n=12)	4.0% (n=4)	N/A (n=0)	3.0% (n=3)
Individual level							
Orphanhood: Double orphan (both parents not alive)	N/A (n=0)	5.0% (n=1)	55.0% (n=11)	35.0% (n=7)	N/A (n=0)	5.0 % (n=1)	N/A (n=0)
Safety: Doesn't feel safe at school cs_w14s	13.8% (n=8)	20.7% (n=12)	31.0% (n=16)	20.7% (n=12)	3.5% (n=2)	1.7% (n=1)	8.6% (n=5)

Table 3-9: Barriers to education by county

Barriers	County			
	Kajiado	Kilifi	Makueni	Uasin Gishu
Parental/caregiver support:				
Insufficient time to study because of high chore burden i.e. High=½ day or more (PCG_26g=1,2,3)	14.3% (n= 6)	11.1% (n=42)	7.5% (n=22)	18.4% (n=33)
Doesn't get support to stay in school and do well (hhg_7)	1.0% (n=4)	4.0% (n=50)	1.0% (n=10)	1.8 % (n=18)
School Level:				
Disagrees teachers make them feel welcome (CS_WA)	2.4% (n=10)	3.4% (n=43)	1.9% (n=19)	2.9% (n=29)
Individual level:				
Orphanhood: Double orphan (both parents missing)	0% (N=442)	0.6% (n=9)	0.6% (n=6)	0.5% (n=5)
Safety: Doesn't feel safe at school (cs_w14s)	0.5% (n=2)	3.0% (n=36)	1.5% (n=14)	0.7% (n=6)

The qualitative data that could be linked to barriers show that stakeholders are concerned and aware of some of the barriers and how they affect girls' education. For instance, on the language in instruction, a

teacher in Makueni supported the use of English as LOI because it eases the teaching of letter sounds that are critical acquisition of reading skills. The teacher argued that when the government introduced the Tusome program, pupils had serious reading problems due to heavy influence of mother tongue, but with iMlango, things are a bit easy because of the 'gadget' that supports the teacher to navigate this.

The stakeholders also thought that poverty had a big role to play in girls' education outcomes. During an FGD ion Kilifi, one father lamented that poverty levels are so high such that it is difficult to pay for 'electricity bills', hence pupils hardly access lighting to do their after school homework. In Makueni, teachers argued that despite the high poverty levels that are associated with low parental education and orphanhood, most girls do their best to attend school regularly, which is a mark of resilience. The influence of poverty on school attendance was echoed by teachers in Kilifi, who observed that the 'one-week' meal card supports not only the girl who attends school but also those at home who may not be of schooling age, hence sometimes a girl may miss school even with a 'meal-card'. In Uasin Gishu county, teachers associated school dropout among girls due to poverty. One teacher observed that 'these girls sometimes drop out of school when they reach puberty because of the poverty at home'. This teacher was alluding to early marriages and/or teenage pregnancy that mainly happen at the onset of puberty causing the school dropout.

The EE qualitative excerpts also confirmed that in the target communities, barriers to girls' education are gender based. In Kilifi, a county with about 22% adolescent pregnancy rate[34], fathers are more inclined to boys' education. For example, in a fathers FGD, one of the participants observed that 'I have realized education is important for both boys and girls because even when you educate the boys and they mature and build their homesteads, they still cannot forget about their parents because they raised him up. My view is that it is important to educate boys because they assist their parents and they depend on him as he matures'.

3.5 Appropriateness of project activities to the characteristics and barriers identified

Prevalence of characteristics in project and evaluation samples: The project estimated to reach 68,000 marginalised girls (about 45% of the targeted beneficiaries) spread across rural counties. From the tables above (Table 3-6 to Table 3-9), and based on the identified barriers, the EE estimates about 30% of girls at various levels who either came from household heads with no formal education or from poor households or did not speak LOI or were married or had various forms of disability.

It is also worth noting the existence of a considerable proportion (about 30%) of pupils with disability – much higher than what the project expected. One of the reasons for this high disability prevalence is the inclusion of serious illness in this category. Once we exclude this category (serious illness, see Table 3-4), the overall disability prevalence drops to about 3.8% which compares well with the 3.6% disability prevalence among the general population of Kilifi (literature was only available for Kilifi [35]).

Subgroups at risk: Baseline data findings revealed that, apart from what already identified by the project, some other subgroups of girls may be at risk of education marginalization. For instance, baseline results (in Table 3-6) showed that about 17% of the girls in both intervention and control group may be at risk of education marginalization because of teacher classroom absenteeism. Likewise, also about 17% of the girls in both groups were at this risk because of insufficient provision of clean water at home; about 17% of

[34] See Kilifi County CIDP from www.kilifi.go.ke/lib.php?com=6&res_id=646
[35] Kilifi County CIDP available from www.kilifi.go.ke/lib.php?com=6&res_id=646

the girls in both groups because their families could not afford medicines or medical treatment; and around 14-16% across the two groups were at risk because of serious illness.

Prevalent barriers: The most prevalent barrier identified by the analyses under economic marginalisation was affordability of school levies and cash flow (income). In the Theory of change, this barrier is addressed through microloans and stipends (the later was discontinued in August 2018) to households who are most at risk. These components of the intervention aim to mitigate economic barriers; if the mitigation is effective, it is expected that attendance will improve, this in turn could lead to improvement of learning outcomes. The project plans to monitor attendance at school level on a daily basis and report it termly. Economic barriers may also be responsible for the household chore burden among girls that is likely to lead to poor school attendance and if not monitored could result to chronic absenteeism.

Intervention versus barriers*:* The perceptions of some of the participants in the qualitative research indicate a degree of the appropriateness of the iMlango interventions in overcoming the barriers. However, it was not possible to determine the extent to which the interventions are able to address the barrier at this stage of the project.

Among the MOE officials (CEO, Kilifi; CEO, Uasin Gishu; CSO, Makueni) there was the perception that iMlango has improved attendance. They posit that it has done so because it has increased the confidence of girls thus encouraging them to be in schools. A CEO in Uasin Gishu, participating in a KII had this to say:

''Girls attendance has improved: It has value because mostly the iMlango has encouraged most our school girls on the program and I think statistically you will that the increment of numbers has actually come up in most of those schools if you compare [Inaudible 0:21:06] or there even more girls than the boys in the centres or in the schools''.

A Ministry of Education official in Uasin Gishu said that iMlango has reduced absenteeism in schools because of the projects' interventions. He said, *''I know that iMlango, other than the provision of with the ICT infrastructure, they are also- they have some other packages for the school here even food program- so they are impacting. If the girls are provided for to stay in school and to reduce absenteeism and to promote their health and hygiene*

*"*One chief said that the project is helping to challenge traditional beliefs about only educating boys in the areas (Chief, Makueni). Another chief said that girls in iMlango schools go to school because the interventions are interesting. It is promoting (attendance) because the child likes school. They don't go for the casual labor they were going'', he said.

Among the parents who benefited from the stipends, four (1 in Kajiado, 2 in Kilifi and 1 in Uasin Gishu) said that the stipends had helped them to keep their daughters in school. One of the parents, a motorcycle rider in Kajiado said that the school levies are now easier for him to pay owing to the stipends support.

In interview with BOM members in Uasin Gishu, the possibility of increased attendance due to iMlango was alluded to, ' … *before the coming of iMlango, absenteeism was very high, but since iMlango came, absenteeism has really reduced'*. In Kilifi, the BOM members felt that iMlango is a timely project to address the household based barriers faced by the girl child.

From these brief texts based on the qualitative data, it is evident that iMlango may be addressing the key barriers, this would be further researched at the Midline evaluation point Furthermore, economic, gender-based issues, disability, individual level and school-based barriers are among the barriers identified at baseline. In the project's theory of change, these barriers have been mentioned and the intervention provided mitigating mechanisms on most of them. For instance, economic barriers through microloans and

stipends will cushion the households against negative effects of poverty including reducing the household chore burden on girls. Improvements in teaching styles to include inclusive approaches will ensure pupils with disability are actively engaged during classroom instruction. Sensitising the households, parents and community on girls' education could have positive effects on gender-based bias in school enrolment and attendance in favour of girls. At individual level, issues of single and double orphans were identified; this information is crucial to the project's efficient targeting of household beneficiaries for microloan and stipends.

Box 2: Project's contribution

The main barriers identified by the EE are as follows:

- Girls getting into relationships with men that leads to poor attendance and low completion rates of primary schools. This barrier has been mentioned in multiple FGD's across the counties that the project is intervening in.
- Culture and attitude on educating girls. Incidences of parents forcing the girls to early marriages and parents giving chores to girls as well as preference to educate the boys over the girls.
- Economic challenges were mentioned as a contributing factor to non-attendance of girls in schools by participants across all counties.
- Lack of sanitary towels during the menstruation.
- Safety concerns related to sending the girl to the school.
- Long walking distance to the school.
- Main LoI is different than mother tongue.
- High level of the disability.
- Girls being at risk of education marginalization because of teacher classroom absenteeism.

Economic Barrier: Further findings confirmed that high chore burden and lack of time to study as well as the parents giving chores to girls mainly related to poor households, which was further reconfirmed as a main barrier by the EE. The project reflects on this barrier in Annex 13.

Culture and attitude on educating girls: The project plans to address these barriers through community sensitisation and potentially by using the DLA content.

Disability: High level of disability has been surmised as a barrier, however further analysias indicated that this findings might be skewed due to inclusion of "serious illness" into the calculation. After deduction, the percentage of the parents that confirmed the "serious illness", the findings suggest that the overall disability prevalence drops to about 3.8% and is comparable to overall population. The EE further concluded that there are no findings indicating that the girls are discriminated in the iMlango schools. The approach to this barrier has been further explained in the Annex 13.

Teacher's absenteeism: The teacher's absenteeism is very sensitive issue. The project recognizes that is an important factor that might contribute to the learning loss and feels this issue is more related to vacuum of strong the leadership provided by headteachers. Please refer to Annex 13 for the project response.

LoI different than mother tongue: This finding has been identified also during GEC-1. Please refer to Annex 13 for more information.

Safety concerns: Safety concerns relate to sending the girls to school which might be interlinked to the long distances those girls have to travel to get there. This finding is new to the project and further engagement with the BoM and the headteachers is needed to ensure that in schools where this is an issue, there is some measure put in place such as volunteers from the community to accompany the students to school.

Overall, the EE findings indicate that the most of the originally identified barriers by the project are relevant and that the activities undertaken by the project are targeting these barriers. Therefore, the project will not be updating its ToC at this stage. This will be reviewed again at midline when changes might be identified.

4. Key Outcome Findings

4.1 Learning Outcome

4.1.1 Description of the learning tests and subtasks

For each subject (literacy and numeracy), two tests were used to assess student achievement - namely EGRA and SeGRA for literacy, and EGMA and SeGMA for numeracy. The EGRA and EGMA tests were simpler tests and assessed aspects of literacy and numeracy that are covered in early primary school grades (i.e. Grades 1 to 3) while the SeGRA and SeGMA tests assessed literacy and numeracy aspects that are covered in upper primary school grades (i.e. Grades 4 to 8).

Five subtasks were included in the EGRA test (Letter name identification, Familiar words, Invented words, Oral reading fluency, and Comprehension) while the SeGRA test involved three subtasks (Analytical comprehension, Inferential comprehension, and Essay writing). On the other hand, the EGMA test involved six subtasks (Missing number, Additional level 1, Additional level 2, Subtraction level 1, Subtraction level 2, and Word problems) and the SeGMA test involved three subtasks (Advanced multiplication and addition, Algebra, and Data interpretation).

The lower grade tests (i.e. EGRA and EGMA) were administered on a one-to-one basis using tablets and each assessment took about 15 minutes. Each EGRA or EGMA assessment was preceded by an introductory 1-2-minute interaction between the assessor and the learner so that the learner could relax. In addition, a few practice items were administered before the test items to ensure that the learner understood the test requirements. On the other hand, the upper grade tests (i.e. SeGRA and SeGMA) were paper-based and these were administered on a whole-class basis. Each SeGRA or SeGMA assessment took 15 minutes for each subtask completed. For instance, if the student was required to complete only the first subtask of SeGRA (like was the case for students in Grade 4 for benchmarking), then such as student was allowed 15 minutes to complete the SeGRA test; and if the student was required to complete all the three SeGRA subtasks (like was the case for students in Grade 8), then such a student was allowed 45 minutes to complete the SeGRA test.

Marking of the EGRA and EGMA items was done automatically using tablet technology while the SeGRA and SeGMA items were marked manually by the enumerators and the marks were thereafter entered in preparation for data cleaning and analyses. During the marking process and before the data were entered, the team leaders re-marked at least 5% of the test scripts so as to countercheck the accuracy of the marking. Any discrepancy identified by the team leader in the marks allocated was sorted out with the enumerator who was involved in marking the script. In addition, a further check for accuracy in marking and data entry, members of the core research team took a random sample of the original test scripts and compared the information appearing on these scripts with the marks allocated scripts and entered.

4.1.2 Overall and subtask results for literacy and numeracy

Looking at the learning outcomes in literacy (EGRA & SeGRA) shown in Table 4-1, there seem to be a baseline balance between the intervention and control groups. Comparing the data of the intervention groups pooled together with that of the control group (i.e. A+C+B versus D), the overall difference in mean score is quite small (0.67) and of no statistical significance (p=0.28). Likewise, comparing (A+C versus D) or (B versus D), the differences (not shown in Table 4-1) are also very small insignificant. However, after disaggregating data by grades, we find a statistically significant baseline difference between intervention and control groups in favour of the latter – a difference of 1.51 percentage points for the Grade 2 students. This baseline difference will have to be taken into account while computing the effect of the intervention at both midline and endline. Overall, these statistics demonstrate a fairly good baseline balance. That said,

the mean scores of above 50% for girls in Grades 6 and 7 at baseline could be an indication for potential ceiling effects at midline and endline. Unfortunately, this potential ceiling effect was not picked during piloting perhaps because only a few schools were involved in the piloting and it could be that these schools (by chance) happened to be low performing. One way to mitigate this is to consider adding items with high level of difficulty in the SeGRA tool.

Table 4-1: Literacy results (aggregated EGRA and SeGRA score)

Grade	Group A+C, Mean Score (n=1680)	Group B, Mean Score (n=1076)	Intervention Group Mean Score (n=2,756)	Control Group Mean (n=1,080)	Difference[36]	P-value
S2	25.8(11.00)[37]	24.5(11.20)	25.31(11.12)	26.82(10.92)	1.51	0.03
S6	53.3(10.30)	56.8(9.40)	52.62(10.31)	53.69(9.36)	1.06	0.09
S7	57.7(9.40)	51.6(10.30)	57.35(9.38)	57.11(9.46)	0.24	0.68
Total	**45.9(17.40)**	**44.6(17.40)**	**45.40(17.38)**	**46.06(16.74)**	**0.67**	**0.28**

Table 4-2: Numeracy results (aggregated EGMA and SeGMA score)

Grade	Group A+C, Mean Score (n=1693)	Group B, Mean Score (n=1091)	Intervention Group Mean Score (n=2,784)	Control Group Mean (n=1,086)	Difference[38]	P-value
S2	29.30(12.00)	28.10(12.90)	28.82(12.39)	28.71(12.05)	0.11	0.88
S6	58.30(9.70)	56.20(10.70)	57.45(10.16)	56.33(10.4)	1.11	0.08
S7	63.10(10.10)	61.30(11.20)	62.4(10.56)	61.29(10.39)	1.10	0.09
Total	**50.60(18.20)**	**48.80(18.60)**	**49.9(18.37)**	**48.89(18.02)**	**1.01**	**0.12**

Similarly, the results for numeracy are presented in Table 4-2. The overall differences between intervention (A+C+B) and treatment (D) groups in numeracy mean scores (EGMA & SeGMA) are small and statistically insignificant. Likewise, comparing (A+C versus D) or (B versus D), the differences (not shown in Table 4-2) are small and insignificant. Even after disaggregating data by grade, the differences remain small and insignificant. However, as observed in literacy, the mean scores of above 50% for girls in Grades 6 and 7 at baseline could be an indication of possible ceiling effects at midline and endline. Again, as was the case for literacy, this potential ceiling effect was not picked during piloting and this could be related to the performance levels of the schools involved in the piloting exercise. Similar mitigation strategy like that suggested for literacy could be applied here.

Apart from the overall mean score analysis presented above, we have looked at the performance of girls in each subtask at the literacy and numeracy tests to understand better their performance and the suitability

[36] This is between overall intervention (A+B+C) and control (D).
[37] In this table and the next, the numbers in parenthesis (*) are standard deviations
[38] This is between overall intervention (A+B+C) and control (D).

of the tests. The results of this analysis are shown in Table 4-3 and Table 4-4 for numeracy and literacy respectively. Table 4-3 gives a diagnosis of the levels of proficiency in numeracy among girls in the intervention group. When interpreting these results, it should be noted that students were included in the analysis only if they were the intervention schools and had completed at least the EGMA test. Grade 2 students were not required to complete the SeGMA test, and that is why their statistics for the SeGMA subtasks (i.e. Subtasks 6, 7 & 8 in Table 4-3) are included in the "Missing by design" category.

From the results in Table 4-3, it is evident that the subtasks used were of varied levels of difficult with Subtask 1 (missing number) having a low level of difficult and Subtask 9 (data interpretation) having a high level of difficult. The varying level of difficulty is more evident if one compares the proportion of established and proficient learners across the subtasks. The subtasks were a reflection of foundation skills in numeracy. Further diagnosis of numeracy proficiency levels shows that about one-half (51.2% and 51.4%) of the girls were proficient learners in regards to Subtasks 2 and 3, respectively; meaning that we could experience some ceiling effects in these two subtasks in subsequent data collection rounds. However, the levels of proficient learners were generally low in all the other subtasks, and more so in Subtask 9 (0%) and 8 (0.1%); meaning that these subtasks are unlikely to experience ceiling effects - and thus will be useful in tracking learning progress in mathematics among the girls.

Table 4-4 provides information about literacy levels. Students were included in this analysis if they had completed at least the lower grade test (in this case EGRA). By design, Grade 2 students were not required to complete the upper grade test (SeGRA) and their data are included in the "Missing by design" category.

Results show that a vast majority of the girls were proficient learners in regards to the first four subtasks (52.9% – 72.8%) - indicating little room is left for improvement in these four tasks subsequent data collection rounds, and thus potential ceiling effects. Nevertheless, this ceiling effects were expected given than most of the girls tested were in the upper primary school grades (i.e. Std. 6 & 7). On the contrary, the levels of proficient learners in the last four subtasks were very low (0.2% - 7.1%); indicating that these subtasks are suitable for tracking learning progress in literacy subsequent data collection rounds. Surprisingly, the level of proficient leaners in subtask 1 (letter name identification, 52.9%) was noticeably lower when compared to the levels of proficient learners in tasks that are expected to be more complex such as subtask 2 (familiar words, 72.8%) or subtask 4 (oral reading fluency, 70.4%). Similar observations were made during piloting though at that time subtask 1 involved letter sound identification rather than letter name identification. Consequently, after piloting and with the support of the fund manager, a decision was made to replace the letter sound task with the letter name tasks with a hope that the latter task would be less difficult compared to the tasks that are known to be more complex – but this clearly did not work as expected. Our field teams noted that considerable numbers of students seemed to confuse letter sounds with the letter names despite the fact that the instructions were very clear on what was expected from the students on this task. It is likely that this confusion by students could explain the inconsistency results. Moving forward, it would appear worthwhile to drop the letter name identification tasks in subsequent data collection rounds because of this inconsistency.

From the results, it can be seen that the majority of the girls were proficient learners in regards to subtask 4 (oral reading fluency, 70.4%) but had problems with subtask 5 (comprehension, 7.1%). Nevertheless, this was expected since literature shows that tasks of comprehension are generally poorly performed.

Table 4-3: Foundational numeracy skills gaps – for intervention group

Learner Type	Subtask 1 Missing number	Subtask 2 Additional level 1	Subtask 3 Additional level 2	Subtask 4 Subtraction 1	Subtask 5 Subtraction level 2	Subtask 6 Word problems	Subtask 7 Advanced multiplication, division etc.	Subtask 8 Algebra	Subtask 9 Data interpretation etc.
Non-learner 0%	0.6%	0.5%	3.3%	2.3%	9.6%	11.0%	0.0%	38.6%	55.3%
Emergent learner 1%-40%	13.3%	13.4%	13.3%	26.7%	18.6%	23.1%	22.1%	21.0%	7.1%
Established learner 41%-80%	50.9%	34.9%	31.9%	50.5%	36.7%	29.9%	34.9%	2.9%	0.2%
Proficient learner 81%-100%	35.3%	51.2%	51.4%	20.6%	35.1%	36.0%	5.4%	0.1%	0.0%
Missing by design[39]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	37.5%	37.5%	37.5%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

[39] Missing by design are grade 2 girls excluded from the analyses because they were not required to complete the upper grades test (SeGMA). The alternative to this would be to include the grade 2 girls in the "non-learner" category – meaning that the statistics for this category would be inflated, and thus, misleading.

Table 4-4: Foundational literacy skills gaps – for intervention group

Learner Type	Subtask 1 Letter Name Identification	Subtask 2 Familiar Word	Subtask 3 Invented Word	Subtask 4 Oral Reading Fluency	Subtask 5 Comprehension	Subtask 6 Comprehension (+ analytical)	Subtask 7 Comprehension (+inferential)	Subtask 8 Short essay
Non-learner 0%	0.0%	0.2%	0.2%	0.1%	27.8%	4.6%	10.7%	27.1%
Emergent learner 1%-40%	15.1%	12.0%	12.0%	11.1%	42.9%	27.9%	42.2%	17.8%
Established learner 41%-80%	32.0%	15.1%	22.3%	18.4%	22.3%	25.2%	9.5%	14.3%
Proficient learner 81%-100%	52.9%	72.8%	65.5%	70.4%	7.1%	4.9%	0.2%	3.3%
Missing by design[40]	0.0%	0.0%	0.0%	0.0%	0.0%	37.4%	37.4%	37.6%
Total	100%	100%	100%	100%	100%	100%	100%	100%

[40] Missing by design are grade 2 girls excluded from the analyses because they were not required to complete the upper grades test (SeGRA). The alternative to this would be to include the grade 2 girls in the "non-learner" category – meaning that the statistics for this category would be inflated, and thus, misleading.

4.1.3 Qualitative analysis of perceived impact in performance of pupils as a result of iMlango

The analysis of information from qualitative research participants on their perceptions on the impact of iMlango in relation to performance of the daughters showed that a total of 5 young mothers who participated in IDI with Parents (2 in Uasin Gishu, 2 in Makueni and 1 in Kilifi) felt that the project has helped to improve children's school performance. One of the mothers (Uasin Gishu) said that she has observed an improvement in maths and writing. Another of the mothers(Kilifi) said that she had seen the mean score of the school improving. Another parent in Makueni spoke of improvement from 250 marks to 300 marks and attributed the change to the project as shown in the quote below,

*Because their performance wasn't good before. Their performance was very low. Reaching 250 marks was a problem. But now they have reached above 300. Yes. Even reading was a problem for them and they have improved, right now they are reading very well. When he was in class five, I was even saying I don't know if they are being taught in this school. [*A stipend parent, Makueni]

During an FGD with old fathers in Kilifi, one father said that performance during exams used to be very poor ''but today the performance is very good for those going to form one unless of course they don't have funds for school fees''.

Among the girls who participated in the FGD Girls, two from Kilifi County said that academic performance has increased because they are able to research from the computer on their own and get answers to the difficult questions or things that they do not get in the text books. One Kilifi girl said, ''*I have seen changes because it has helped us in our education, for example if you don't know anything and it is not in the text book, if you refer to the computer you can get it''. A girl in Uasin Gishu said that computers help them retain the knowledge that is imparted to them, hence the improved performance.*

Notably, one boy (FGD Boys, Kilifi) said that he has seen improvement of girls' performance "as a result of this use of laptops'. In Makueni, one boy said that the things they have learned in iMlango have been brought in examinations, it helps many people learn and they get good marks and pass exams. Another boy in the same FGD said that there are girls who used to get 200 marks but now they are getting 300 because of iMlango. Yet another boy spoke of girls starting to defeat boys ''a bit''. One boy in Uasin Gishu said that girls who have transferred from other schools to his school have improved ''because of the computers''.

Two teachers in Kilifi participating in FGD teachers attributed the academic improvement of girls to increased attendance. One Teacher in Makueni said that he has noticed better performance in writing ''because of the literature and the stories that they read''. He said that when it comes to Maths, the pupils who never liked Mathematics are now able to solve questions in Mathematics, they are enjoying the subject and they are ready to work. He attributed this to Maths Whizz and literature that they get by reading story books in the computers. A teacher in Kajiado attributed the project to the improvement of the mean score of his subject which is not mentioned.

"Okay with me as I said earlier it has made my subject to be very interesting and real and my performance okay my subject performance, has gone up the mean score of what I teach has gone up compared to what they used to get before the coming of iMlango, yes" (FGD Teachers, Kajiado).

The perception that iMlango has helped to improve performance was also expressed by a head teacher from Kilifi who said the pupils have benefitted even in terms of academic performance. The head teacher said, '' *It has helped them in performance. Their performance rate is now high".* Two head teachers from Makueni said that using ICT for learning has got a positive impact in the learning system. And if well utilized, it can also help in improving performance of the school which, he said was ''still a bit low''. One of the Makueni head teachers said that girls in his school had posted better results than the boys and he had

talked to the boys to catch up. A head teacher in Kajiado spoke of the use of projector in class as enhancing comprehension and contributing to the improved performance. In Uasin Gishu, a head teacher spoke of difficulties of using the resources in the beginning but now they have understood how to use them, performance has improved ''especially in language and in maths''.

In FGD with members of BOMs, perception that iMlango has improved performance was expressed by 3 BOM members in Makueni, Kilifi and Uasin Gishu. A BOM member in Uasin Gishu said, '' *Okay, generally the performance in this school – this is a school which is excelling in this region. It is a school of excellence and I believe iMlango has assisted them".* In another FGD BOM in Uasin Gishu, one member said that there is notable improvement in mathematics. ''Now we just want to know why English is not performing better as well''

A member of the BOM in Kilifi attributed the performance of former pupils of the school, now in high school to the project. His words were, ''*They were taught here and completed their class eight and joined Barani high school. And at the end of last term they were the best students*''. A BOM member in Makueni said that he had witnessed how the project has made it easy for the pupils to grasp mathematics. He said, ''*The program especially the mathematics program, I would like to say it is very easy for the student and they are also helped in a way to improve to bring in terms of the performance because it was very good. Because when they were doing Mathematics with computer, that is one thing I know, I saw myself and saw it's very effective".*

However, our quantitative data (Tables 4-1 & 4-2) reveals that, on overall, the difference between intervention and control schools in terms of learning scores was not significant. It is likely that the qualitative data showed impact because it is based on parental percentions and what parents could be seeing is just normal improvement in girls performance as they grow older.

4.1.4 Grade achieved analysis

After following the FM instructions to calculate the Grade Achieved, we end up with the results that are shown in Table 4-5 and Table 4-6.

Table 4-5: Grade achieved in literacy subtasks – original methodology

	Relevant subtasks	Criteria for Literacy	Overall (%)	Grade 2 (%)	Grade 6 (%)	Grade 7 (%)
Below Grade 1	Every task	None of the below criteria met	9.9	28.5	1.2	0.7
Grade 1 achieved	Subtask 1, 2 and 3 (EGRA)	Proficient in Letter Sound Identification, Familiar Word, Invented Word	0	0	0.1	0
Grade 2 achieved	Subtask 4 (EGRA)	Established in Oral Reading Fluency	54	71.1	54.3	37.4
Grade 3 achieved	Subtask 5 (EGRA)	Proficient in Comprehension of short fluency paragraph	1.1	0.4	1.6	1.2
Grade 4 achieved	Subtask 6 (SeGRA 1)	Established in Comprehension using simple inferences	20.8	0	27.9	33.7
Grade 5 achieved	Subtask 6 (SeGRA 1)	Proficient in Comprehension using simple inferences	2.2	0	2.6	3.9
Grade 6 achieved	Subtask 7 (SeGRA 2)	Established in Comprehension using complex inferences	8.6	0	9.3	16.3

	Relevant subtasks	Criteria for Literacy	Overall (%)	Grade 2 (%)	Grade 6 (%)	Grade 7 (%)
Grade 7 achieved	Subtask 7 (SeGRA 2)	Proficient in Comprehension using complex inferences	0.1	0	0.1	0.3
Grade 8 achieved	Subtask 8 (SeGRA 3)	Established in Short Essay construction	3.3	0	3.1	6.6
Grade 9 achieved	Subtask 8 (SeGRA 3)	Proficient in Short Essay construction	0	0	0	0

Table 4-6: Grade achieved in numeracy subtasks– original methodology

	Relevant subtasks	Criteria for Numeracy	Overall (%)	Grade 2 (%)	Grade 6 (%)	Grade 7 (%)
Below Grade 1	Every task	None of the below criteria met	47	96.8	28.8	17.2
Grade 1 achieved	Subtask 1 and 2 (EGMA)	Proficient in Number Identification and in Quantity Discrimination	3.9	1.6	6.3	3.6
Grade 2 achieved	Subtask 3 and 4 (EGMA)	Proficient in Missing Numbers and Additions	1	0.3	1.4	1.4
Grade 3 achieved	Subtask 5 and 6 (EGMA)	Proficient in Subtractions and Words Problem	3.7	1.3	6.3	3.5
Grade 4 achieved	Subtask 7 (SeGMA 1)	Established in Advanced multi and division etc.	37.6	0	53.5	57.9
Grade 5 achieved	Subtask 7 (SeGMA 1)	Proficient in Advanced multi and division etc.	3.8	0	3.1	8.1
Grade 6 achieved	Subtask 8 (SeGMA 2)	Established in Algebra	2.7	0	0.3	7.8
Grade 7 achieved	Subtask 8 (SeGMA 2)	Proficient in Algebra	0.1	0	0.1	0.2
Grade 8 achieved	Subtask 9 (SeGMA 3)	Established in Data Interpretation etc.	0.2	0	0.2	0.4
Grade 9 achieved	Subtask 9 (SeGMA3)	Proficient in Data Interpretation etc.	0	0	0	0

Looking at the results that are based on the instructions provided originally by the FM, we are not able to get a clear picture on the proficiency level of the girls. In an attempt to improve our understanding of the grade achieved, we have computed the 'competency achieved' or 'competency levels' based on the approach described below. The results of this approach are presented in Tables 1 to 5 (and Figures 1 and 2). If these results are promising, then a consultative meeting with local practicing teachers, assessors and curriculum developers could be held to map these levels to grades. Such a forum would identify which specific items should be used to for grade achieved.

Numeracy competency levels

The following steps were followed in development of competency levels for numeracy:

- Mean scores of each the nine numeracy subtasks by grade was calculated (results in

Table **4-7**). This was done so as to establish the levels of difficulty of the subtasks relative to each other, and also to examine if the difficulty of the subtasks varied across the grades. Thus, the easiest task on overall was Additional level 2 (78.8%) while the hardest subtask was Data interpretation (1.3%). These results were considered a little problematic because some tasks that are known to be simple were appearing as more difficult than tasks that are known to be more complex. For example, Additional level 1 (74.7%) appeared to be more difficult than Addition level 2. Likewise, Subtraction level 1 (56.3%) appeared harder than Subtraction level 2 (67.0%). It was not clear why the students performed better on tasks perceived to be harder than on those perceived to be easier especially because the same enumerators were used to administer all the EGMA subtasks in the same sitting – thus ruling out the influence of test administration. Nevertheless, it is likely that some students were a bit careless while answering the easier subtask (since they might have perceived these tasks to be easier) and more careful when answering the harder tasks. It is worth noting that the same pattern of student performance on these additional and subtraction tasks was also observed in the pilot data.

- In order to resolve the problem identified in (a) above, a decision was made to combine Additional levels 1 and 2 into one subtask, and to combine Subtraction levels 1 and 2 into one subtasks (results in
- Table 4-8 & Figure 4-1).
- From the results depicted in Figure 4-1, it became clear that the relative difficulty of the subtask on Missing number varied substantially across the grades – with this being the easiest task among grade 2 students but not among grade 6 and 7 students. Because Missing number subtask was the easiest among grade 2 students, it was considered reasonable to build the competency levels starting from this task.
- The final step in the development of the competency levels involved defining **nine** levels as shown in Table 4-9. From these results, it can be seen that a vast majority of the grade 2 students were in numeracy competency levels 2, 3 and 4; while a vast majority of grades 6 and 7 students were in levels 4, 5 and 6.

As a caveat, the nine competency levels should not be interpreted as “grade achieved”. The competency levels need to be linked to grades by mapping them to the curriculum and validating this with practicing teachers.

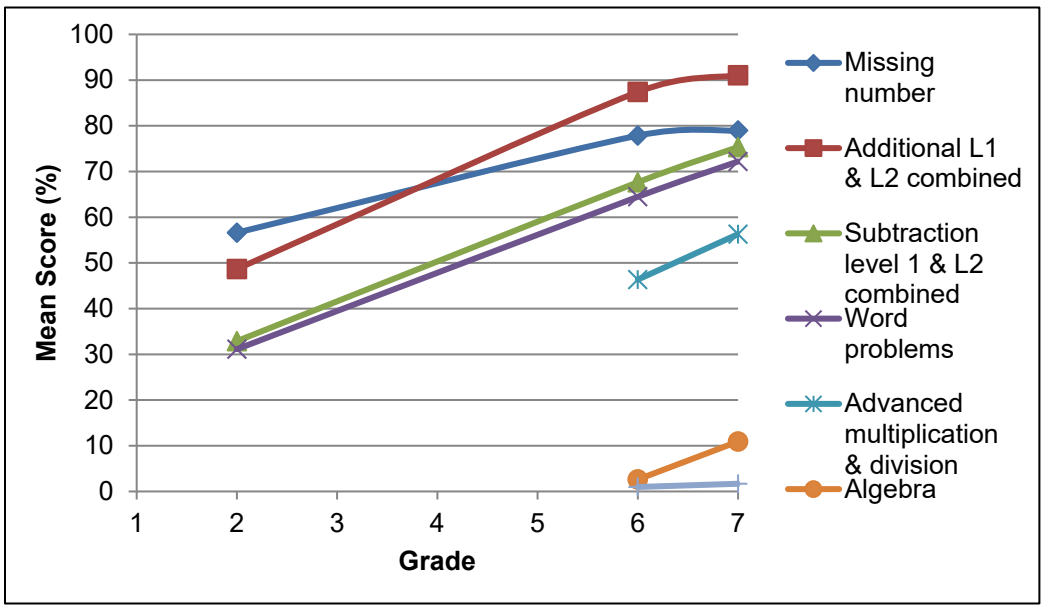


Figure 4-1: Mean scores of the numeracy subtasks across grade after combining some

Table 4-7: Means scores of the original nine numeracy subtasks by grades

Class	Subtask 1 Missing number	Subtask 2 Additional level 1	Subtask 3 Additional level 2	Subtask 4 Subtraction 1	Subtask 5 Subtraction level 2	Subtask 6 Word problems	Subtask 7 Advanced multiplication, division etc.	Subtask 8 Algebra	Subtask 9 Data interpretation etc.
2	56.6	47.1	54.9	31.7	37.6	31.1	-	-	-
6	77.9	86.6	90.7	64.4	80.5	64.5	46.4	2.6	1.0
7	79.0	91.0	91.3	73.3	83.5	72.2	56.3	10.9	1.7
Total	**71.0**	**74.7**	**78.8**	**56.3**	**67.0**	**55.7**	**51.3**	**6.7**	**1.3**

Table 4-8: Means scores of the numeracy subtasks by grades after combining some

Class	Subtask 1 Missing number	Subtask 2 & 3 Additional L1 & L2 combined	Subtask 4 & 5 Subtraction level 1 & L2 combined	Subtask 6 Word problems	Subtask 7 Advanced multiplication & division	Subtask 8 Algebra	Subtask 9 Data interpretation
2	56.6	48.7	32.9	31.1	-	-	-
6	77.9	87.4	67.6	64.5	46.4	2.6	1.0
7	79.0	91.1	75.3	72.2	56.3	10.9	1.7
Total	**71.0**	**75.5**	**58.4**	**55.7**	**51.3**	**6.7**	**1.3**

Table 4-9: Percentage of students achieving various numeracy competency levels by grades

Level	Subtask	Definition	Grade 2	Grade 6	Grade 7	Overall
Below Level 1	All subtasks	Emergent in **Missing Numbers** or below	17.8	0.4	0.1	6.2
Level 1	Subtask 1 (EGMA)	Established in **Missing Numbers**	11.8	0.3	0.0	4.1
Level 2	Subtask 2 & 3 (EGMA)	Established in **Additions**	23.2	2.8	1.8	9.4
Level 3	Subtask 4 & 5 (EGMA)	Established in **Subtractions**	14.3	10.3	7.2	10.6
Level 4	Subtask 6 (EGMA)	Established in **Word Problems**	25.3	17.2	11.7	18.1
Level 5	Subtask 6 (EGMA)	Proficient in **Word Problems**	7.5	14.7	11.0	11.0
Level 6	Subtask 7 (SeGMA)	Established in Advanced **Multiplication and Division**	0.0	53.9	60.2	37.7
Level 7	Subtask 8 (SeGMA)	Established in **Algebra**	0.0	0.2	7.7	2.6
Level 8	Subtask 9 (SeGMA)	Established in **Data Interpretation**	0.0	0.2	0.4	0.2
Level 9	Subtask 9 (SeGMA)	Proficient in **Data Interpretation**	0.0	0.2	0.4	0.2
Total			100	100	100	100

Literacy competency levels

Similar procedure to what was described for development of numeracy competency levels was followed in the development of literacy levels. However, unlike in numeracy where some subtasks were combined, no subtasks were combined in the development of the literacy levels – meaning that all the eight original literacy subtasks were involved in the development. In addition, unlike the case for numeracy where the difficulty levels of the subtasks were notably different, the difficulty levels of some of the literacy subtasks did not differ much, especially for grade 2 (Table 4-10 & Figure 4-2).

Like for the case of numeracy, nine competency levels were also defined for literacy as shown in Table 4-11. Thus, a vast majority of the grade 2 students were in competency levels 5 and 6; while a vast majority of grades 6 and 7 students were in levels 6, 7 and 8. Again, this levels should not be interpreted as "grade achieved" because they have not been mapped to the grades.

Table 4-10: Means scores of the eight literacy subtasks by grade

Class	Subtask 1 Letter names	Subtask 2 Familiar words	Subtask 3 Invented words	Subtask 4 Passage reading	Subtask 5 Comprehension	Subtask 6 Comprehension - Fiction	Subtask 7 Comprehension - Factual	Subtask 8 Essay
2	46.7	57.5	58.4	56.5	12.5	-	-	-
6	88.6	94.7	88.6	96.9	40.8	36.7	20.3	20.5
7	92.2	96.8	91.3	98.6	48.7	46.0	27.1	32.1
Total	**75.5**	**82.7**	**79.2**	**83.7**	**33.8**	**41.3**	**23.7**	**26.3**

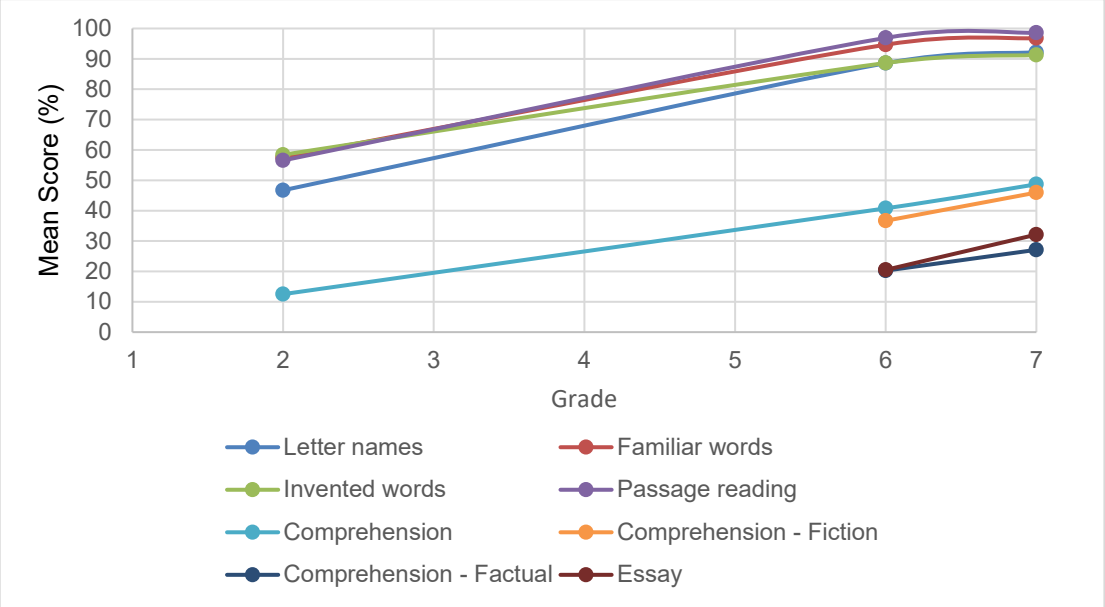


Figure 4-2: Mean scores of the literacy subtasks across grades

Table 4-11: Percentage of students achieving various literacy competency levels by grades

Level	Subtask	Definition	Grade 2	Grade 6	Grade 7	Overall
Below Level 1	All subtasks	Emergent in **Letter Names** or below	15.0	0.1	0.1	5.2
Level 1	Subtask 1 (EGRA)	Established in **Letter Names**	5.7	0.7	0.3	2.3
Level 2	Subtask 1 (EGRA)	Proficient in **Letter Names**	0.0	0.1	0.3	0.1
Level 3	Subtask 2 (EGRA)	Established in **Familiar Words**	1.8	0.2	0.2	0.7
Level 4	Subtask 3 (EGRA)	Established in **Invented Words**	5.9	0.2	0.0	2.1
Level 5	Subtask 4 (EGRA)	Established in **Passage Reading**	48.9	3.5	1.5	18.3
Level 6	Subtask 4 (EGRA)	Proficient in **Passage Reading**	22.3	47.9	34.8	34.9
Level 7	Subtask 5 & 6 (EGRA & SeGRA)	Proficient in **Comprehension 1** & Established in **Comprehension 2**	0.4	27.0	28.4	18.4
Level 8	Subtask 7 & 8 (SeGRA)	Proficient in **Comprehension 3** & Established in **Essay Writing**	0.0	17.0	27.8	14.7
Level 9	Subtask 8 (SeGRA)	Proficient in **Essay Writing**	0.0	3.3	6.8	3.3
Total			100	100	100	100

4.2 Subgroup analysis of the Learning Outcome

4.2.1 Differences in learning levels across regions

Overall, results in Table 4-12 and Table 4-13 show that within each subject there were no much variations in average learning scores across the four counties - implying that the levels of learning achievement in the four counties were about the same. One of the striking observations is that the county (Kilifi) leading in numeracy mean scores is the same county trailing in literacy.

Table 4-12: Literacy mean scores by county and grade (EGRA-SeGRA for intervention group)

Grade	Kajiado	Kilifi	Makueni	Uasin Gishu	Overall mean
S2	26.5(11.7)	25.5(10.6)	22.8(11.2)	26.2(11.3)	25.3(11.1)
S6	54.0(12.5)	50.6(9.4)	54.5(9.9)	53.4(10.2)	52.6(10.3)
S7	59.1(9.1)	54.6(9.4)	59.3(9.0)	58.9(8.9)	57.3(9.4)
Total	**46.7(18.1)**	**43.8(16.1)**	**46.1(18.9)**	**46.5(17.5)**	**45.4(17.4)**
Benchmarking group					
S3	49.3 (4.8)	26.2 (11.0)	32.6 (13.4)	37.2 (8.0)	36.4 (12.8)
S4	46.5 (2.5)	36.4 (5.7)	30.8 (10.5)	41.8 (3.9)	38.3 (8.7)

S8	64.3 (9.2)	56.0 (6.8)	63.9 (7.2)	53.6 (15.4)	59.7 (11.0)
S9	70.7 (7.7)	54.3 (7.0)	64.0 (7.6)	64.0 (5.5)	63.2 (9.0)
Total	**58.0 (12.00**	**42.7 (14.6)**	**47.8 (18.9)**	**49.3 (13.9)**	**49.4 (16.0)**

Table 4-13: Numeracy mean scores by county and grade (EGMA-SeGMA for intervention group)

Grade	Kajiado	Kilifi	Makueni	Uasin Gishu	Overall mean
S2	29.9(11.2)	31.8(12.5)	21.6(10.4)	29.2(12.2)	28.8(12.4)
S6	55.7(11.3)	58.1(10.4)	58(10.7)	57(8.7)	57.5(10.2)
S7	59.1(11.6)	62.7(9.5)	65.8(10.4)	61.2(10.8)	62.4(10.6)
Total	**48.3(17.3)**	**51.1(17.3)**	**49.2(21.7)**	**49.6(17.6)**	**49.9(18.4)**
Benchmark group					
S3	50.6 (5.3)	47.1 (6.6)	38.1 (11.8)	39.1 (13.3)	43.7 (10.9)
S4	44.4 (8.3)	42.0 (8.2)	33.0 (11.3)	44.5 (9.8)	40.6 (10.4)
S8	62.0 (11.1)	64.5 (6.6)	74.6 (8.4)	53.5 (15.4)	63.9 (13.1)
S9	76.0 (10.4)	58.6 (11.8)	73.2 (8.0)	64.5 (14.0)	68.1 (12.9)
Total	**58.6 (15.0)**	**52.5 (12.2)**	**54.7 (21.8)**	**50.6 (16.2)**	**54.1 (16.9)**

4.2.2 Differences in learning across key subgroups identified by the project

Table 4-14 displays the results of literacy and numeracy tests disaggregated by subgroups of interest. The number of cases in some of the subgroups (e.g. married, n=2; mother under 18, n=2) was quite low for meaningful interpretation of the scores and thus such subgroups were excluded from the analysis.

Apart from a few subgroups, the results in Table 4-14 show that the means scores of a vast majority of the subgroups did not differ much from the overall mean score and in most cases were below 50%; meaning that we are unlikely to experience ceiling effects in subgroups in follow up rounds. Nevertheless, the mean scores of girls who reported mobility impairment as well as of those who reported vision impairment were slightly above 50%; implying some potential for ceiling effects in these subgroups in future data collection rounds.

On the other hand, the mean scores for the girls who could not speak the language instruction (LOI) were considerably lower (around 31.5% and 36.0% for literacy and numeracy, respectively) compared to overall mean scores – an indication that LOI is a potential learning barrier. This implies that the project could encourage girls to speak the LOI (i.e. English) as a way of mitigating this barrier. Other subgroups that recorded considerable lower scores compared to the overall mean score included self-care impairment (i.e. girls who have difficulties with self-care such as washing or dressing) and communication impairment (i.e. girls who have difficulties understanding others or being understood). It is likely that the girls in the self-care impairment category also had physical challenges performing other simple physical tasks such as holding a pencil or a pen to write notes and this could have impacted negatively on their learning.

Table 4-14: Learning scores of key subgroups

Subgroup	Average literacy score (aggregate) %	P-value	Average numeracy score (aggregate) %	P-value
Characteristics				
Transition All girls (n=2129)	45.92		49.98	
Living without both parents (PCG_10g) (n=237)	45.80	0.913	50.44	0.669
Living in female headed household (HH_8) (n=611)	46.09	0.813	50.25	0.724
Girl does **not** speak LOI (PCG_3enr) (n=65)	31.47	0.000***	35.88	0.000***
Vision impairment (PGD_Ov12_1) (n=17)	50.7	0.247	55.9	0.132
Hearing impairment (PGD_Ov12_2) (n=19)	45.3	0.904	50.5	0.915
Mobility impairment (PGD_Ov12_3) (n=3)	47.5	0.704	63.8	0.050
Cognitive impairment (PGD_Ov12_4)(n=15)	43.2	0.513	43.5	0.161
Self-care impairment (PGD_Ov12_5) (n=6)	28.6	0.011	44.1	0.361
Communication impairment (PGD_Ov12_6) (n=11)	41.7	0.542	47.9	0.720
Serious illness (PGD_Ov12_7) (n=335)	45.5	0.634	49.6	0.691
HOH no education (HH_13) (n=314)	43.7	0.011**	49.9	0.928
Carer no education(PCG_6) (n=442)	43.8	0.003***	50.3	0.674
Poverty (PCG_7enr=1) (n=1048)	45.4	0.304	49.9	0.918

Notes: Results in this table involve both intervention and control group combined (n=2129);
P-values indicated for t-test to test the mean difference between subgroup mean scores and mean scores for all girls. Asterix indicate statistical significance at ***=p<0.01, **=p<0.05, *=p<0.10.

4.2.3 Differences in learning across barriers experienced

Table 4-15 presents learning scores by the key barriers identified in Section 3.3. From this table, it can be seen that mean learning scores for some barriers did not differ much from the overall mean scores of all the girls pooled together – indicating that there were no major learning disadvantages associated with such barriers. Examples of such barriers include fairly unsafe or very unsafe travel to school in the area and incidences of going to sleep hungry.

On the other hand, some barriers were associated with noticeably lower scores compared to the overall mean – for example, not feeling safe at school (especially for numeracy), insufficient time to study due to high household chores (for numeracy), not speaking the language of instruction (for both subjects). This indicates that such barriers were perhaps associated with considerable learning disadvantages.

Table 4-15a: Learning scores by key barriers (transition cohort)

Barrier	Source	Cases (n)	Average literacy score (Aggregate) %	p-value	Average numeracy score (Aggregate) %	P-value
All girls		2129	45.9		50.0	
Safety						
Fairly or very unsafe travel to schools in the area	PCG_9	218	45.9	0.991	49.2	0.572
Parental/caregiver support						
Sufficient time to study: High chore burden (High=½ day or more)	PCG_26g	103	40.7	0.006***	46.0	0.048**
HH economic marginalization						
Difficult to afford for girl to go to school	pcg_7enr	1048	45.4	0.304	49.9	0.918
HH unable to meet basic needs	pcg_5econ_i	550	43.4	0.000***	48.8	0.153
Ever gone to sleep feeling hungry many/ most days	pcg_7econ	507	44.2	0.015**	49.5	0.579
Gone without clean water many / most days	pcg_8econ	377	46.3	0.628	50.7	0.456
Gone without medicines/medical treatment many/ most days	pcg_9econ	370	43.9	0.022**	48.5	0.147
Gone without cash income many/most days	pcg_10econ	1218	44.7	0.011**	49.0	0.066*
Does not own any land	pcg_11econ	483	45.3	0.449	49.2	0.374

Notes: Results in this table involve both intervention and control group combined (n=2129);
P-values indicated for t-test testing the mean difference between subgroup mean scores and mean scores for all girls. Asterix indicate statistical significance at ***=p<0.01, **=p<0.05, *=p<0.10.

Table 4-15b: Learning scores by key barriers (learning cohort)

Barriers	Source	Cases (n)	Average literacy score (Aggregate)%	P-value	Average numeracy score (Aggregate)%	P-value
All girls		3964	45.4		49.4	
Safety						
Doesn't feel safe at school	CS_W14s	58	39.9	0.015**	45.0	0.063*
School facilities						
No seats for all students	CS_W5s	377	41.7	0.000***	45.9	0.000***
Doesn't use drinking water facilities	CS_W7s	409	45.0	0.652	48.4	0.231

Doesn't use books and other leaning materials while at school	cs_w2s	104	44.5	0.598	47.3	0.273
Teachers						
Disagrees teachers make them feel welcome	CS_WA	101	40.9	0.010**	45.6	0.049**
Agrees teachers treat boys and girls differently in the classroom	CS_1s	507	39.7	0.000***	43.1	0.000***
Agrees teachers often absent from class	CS_2s	677	42.5	0.000***	45.7	0.000***

Note: Results in this table involve both intervention and control group combined (n=3964).).
P-values indicated for t-test testing the mean difference between subgroup mean scores and mean scores for all girls. Asterix indicate statistical significance at ***=p<0.01, **=p<0.05, *=p<0.10.

4.3 Transition Outcome

The transition pathways defined in the MEL-F are presented in Table 4-16 and Figure 4-3. Based on these pathways, the results for the outcome transition have been calculated for the intervention and control group.

Table 4-16: Transition pathways

	Baseline point	Successful (Positive) Transition	Unsuccessful (Negative) Transition
Students in primary schools	Enrolled in Standards 1 to 8	• Progression to the next grade • Re-enrol in primary school	• Remains in same grade, if in secondary school • Drops out of school
Students who have completed primary	Enrolled in Forms 1 to 4	• Move into secondary school • Move into TVET or higher education • Re-enrol in secondary school • Remain in same grade, if in secondary school	• Drops out of school • Get employed before completing secondary schools
Children who are out of school	Out of school	• Start attending CIH • Continue attending CIH • Enrol in primary or secondary school • Join TVET	• Not attending CIH • Stop attending CIH • Remain out of school

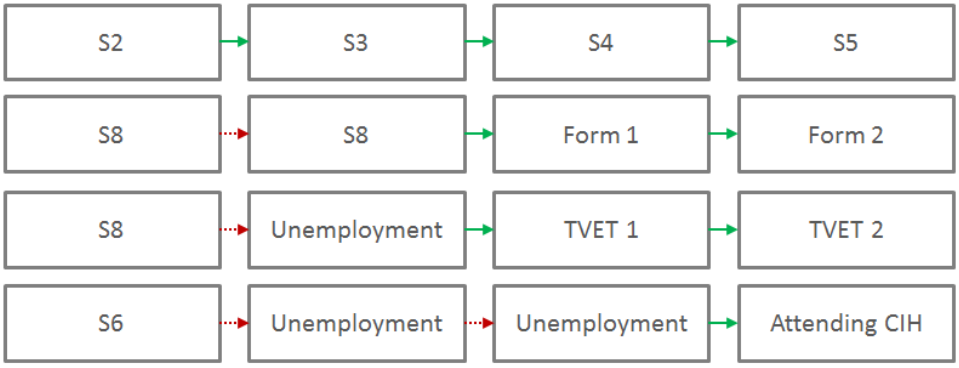


Figure 4-3: Transition pathways examples

The intervention and control group results for the transition sample are presented in Table 4-17 and Table 4-18 respectively. It should be noted here that the "in-school progression" category in our analyses does not include girls in the transition sample who were in Std. 8 and moving to secondary or those who were not in school in the past year and moving to secondary.

Among 1,447 girls who had full transition information out of the 1,525 girls in the intervention group, the in-school progression was 73.4% while this value among the 583 girls in the control group was 55.9%. This means that there was substantial variation in in-school progression among the two groups. In addition, the overall successful transition rate was much better among the girls in the intervention group (92.3%) compared to the control group (89.5%). This is further corroborated by the fact that the overall grade repetition rates were noticeably higher among the control group (10.5%) than among the intervention group (7.7%). Nevertheless, results revealed that grade repetition could be the key driver to low successful rates among both groups. In the intervention group, successful transition rates were highest among the girls who were 18 years old and above – perhaps because these are the girls who are "hardened" having survived in the system the longest. The opposite is true for the control group which shows highest transition rates among the youngest age group (11 and below).

Table 4-17: Transition for the intervention group

Age	Sample size (#)	In-school progression %(n)	Moves into secondary school % (n)	Enrolled in TVET course %(n)	Drops out of school %(n)	Repeated grade %(n)	Re-enrolment % (n)	Successful transition rate per age %(n)
6	19	73.7 (14)	0	0	0	0	26.3 (5)	100.0 (19)
7	107	72.0 (77)	0	0	0	3.7 (4)	24.3 (26)	96.3 (103)
8	154	77.9 (120)	0	0	0	5.8 (9)	16.2 (25)	94.2 (145)
9	77	83.1 (64)	0	0	0	8.0 (6)	9.1 (7)	92.2 (71)
10	56	76.8 (43)	0	0	0	5.4 (3)	17.9 (10)	94.6 (53)
11	134	65.7 (88)	0	0	0	6.0 (8)	28.4 (38)	94.0 (126)
12	265	74.3 (197)	0	0	0	4.9 (13)	20.8 (55)	95.1 (252)
13	288	74.3 (214)	0	0	0	6.3 (18)	19.4 (56)	93.8 (270)
14	188	70.7 (133)	0	0	0	14.4 (27)	15.0 (28)	85.6 (161)
15	104	70.2 (73)	0	0	0	13.5 (14)	16.3 (17)	86.5 (90)
16	36	72.2 (26)	0	0	0	16.7 (6)	11.1 (4)	83.3 (30)
17	11	54.5 (6)	0	0	0	27.3 (3)	18.2 (2)	72.7 (8)
18	7	85.7 (6)	0	0	0	0	14.3 (1)	100.0 (7)
19	1	100.0 (1)	0	0	0	0	0	100.0 (1)
Overall	**1447**	**73.4 (1062)**	**0**	**0**	**0**	**7.7 (111)**	**18.9 (274)**	**92.3 (1336)**

Notes: Re-enrolment refer to girls who were out of school last year and have re-enrolled this/subsequent year. Transition by age was calculated by splitting data by age-group. Successful transition rate per age = in-school progression + re-enrolment + moving to secondary school and joining TVET. Unsuccessful transition rate per age= repeating school grade + dropping out of school. 78 girls were missing transition variable information in the intervention group and hence the total is 1447 as opposed to 1525 reported elsewhere in this report.

Table 4-18a: Transition for the control group

Age	Control group Sample size (#)	In-school progression %(n)	Moves into secondary school %(n)	Enrolled in TVET course %(n)	Drops out of school %(n)	Repeated grade % (n)	Re-enrolment % (n)	Successful transition rate per age %(n)
6	11	54.6 (6)	0	0	0	9.1 (1)	36.4 (4)	90.9 (10)
7	45	55.6 (25)	0	0	0	4.4 (2)	40.0 (18)	95.6 (43)
8	67	53.7 (36)	0	0	0	9.0 (6)	37.3 (25)	91.0 (61)
9	28	60.7 (17)	0	0	0	7.1 (2)	32.1 (9)	92.9 (26)
10	23	69.6 (16)	0	0	0	8.7 (2)	21.7 (5)	91.30 (21)
11	56	60.7 (34)	0	0	0	0	39.3 (22)	100.0 (56)
12	100	55.0 (55)	0	0	0	3.0 (3)	42.0 (42)	97.0 (97)
13	124	59.7 (74)	0	0	0	10.5 (13)	29.8 (37)	89.5 (111)
14	79	48.1 (38)	0	0	0	20.3 (16)	31.6 (25)	79.8 (63)
15	26	38.5 (10)	0	0	0	34.6 (9)	26.9 (7)	65.4 (17)
16	17	70.6 (12)	0	0	0	23.5 (4)	5.9 (1)	76.5 (13)
17	5	40.0 (2)	0	0	0	40.0 (2)	20.0 (1)	60.0 (3)
18	0	0	0	0	0	0	0	0
19	2	50.0 (1)	0	0	0	50.0 (1)	0	50.0 (1)
Overall	**583**	**55.9 (326)**	**0**	**0**	**0**	**10.5 (61)**	**33.6 (196)**	**89.5 (522)**

Note: Re-enrolment refer to girls who were out of school last year and have re-enrolled this/subsequent year. Transition by age was calculated by splitting data by age-group. Successful transition rate per age = in-school progression + re-enrolment + moving to secondary school and joining TVET. Unsuccessful transition rate per age= repeating school grade + dropping out of school. 21 girls were missing transition variable information in the control group hence the total of 583 as opposed to 604 reported elsewhere in this report.

4.3.1 Subgroup analysis of the transition outcome

Transition rates by the key girl characteristics are presented in Table 4-18b while the rates by the key barriers identified in this study are presented in Table 4-18c. From these two tables, it can be observed that, for a vast majority of the characteristics or barriers under consideration, transition rates for the intervention group did not differ much from those for control group. In most cases, the difference between the two groups did not exceed five percentage points – indicating existence of baseline balance across these variables. In nearly all variables under consideration, the level of successful (positive) transition rates were quite high and in most cases were around 90% (or above) – meaning that there is little room left for improvement of these rates in subsequent data collection rounds.

Table 4-18b: Transition outcome by key girl characteristics

10	Intervention			Control			Source
	N	Positive %	Negative %	N	Positive %	Negative %	
Orphans							
Single orphans (no mother)	38	91.6	8.4	9	77.8	22.2	PCG_11g
Single orphans (no father)	139	87.1	12.9	49	91.7	8.3	PCG_13g
Double orphans (both parents absent)	16	81.3	18.8	4	75.0	25.0	PCG_11g & PCG_13g; both var=2
Living without both parents	130	90.0	10.0	49	81.6	18.4	PCG_10g;PCG_12g; both var=5
Living in female headed household	420	92.2	7.8	178	92.1	7.9	HH_8=2
Married	2	100.0	0.0	0.0	0.0	0.0	PCG_22g=1
Difficult to afford for girl to go to school	738	91.1	8.9	309	89.3	10.7	PCG_22g=1
Household doesn't own land for themselves	378	94.7	5.3	99	89.9	10.1	PCG_11econ=4
Household unable to meet basic needs	392	92.6	7.4	147	91.2	8.8	PCG_5econ
Ever gone to sleep hungry many/ most days	373	91.7	8.3	125	91.2	8.8	PCG_7econ
Language difficulties							
LoI different from mother tongue	1,197	92.5	7.5	489	90.2	9.8	PCG_2enr
Girl doesn't speak LoI	49	98.0	2.0	15	93.3	6.7	PCG_3enr=3
Parental education							
HHH has no education	252	89.7	10.3	54	92.6	7.4	HH_13
Primary caregiver has no education	348	90.2	9.8	86	88.4	11.6	PCG_6

Table 4-18c: Transition outcome by key barriers

Variables	Intervention			Control			Source
	N	Positive %	Negative %	N	Positive %	Negative %	
Parental/caregiver support							
Insufficient time to study due to high chore burden	81	90.1	9.9	20	85.0	15.0	Pcg_26g
HH economic marginalization							

Difficult to afford for girl to go to school	738	91.1	8.9	309	89.3	10.7	Pcg_7enr
HH unable to meet basic needs	392	92.6	7.4	147	91.2	8.8	Pcg_5econ_i
Ever gone to sleep hungry many/ most days	373	91.7	8.3	125	91.2	8.8	Pcg_7econ
Gone without clean water many/ most days	270	93.0	7.0	103	95.2	4.8	Pcg_8econ
Gone without medicines/medical treatment many/most days	262	92.0	8.0	103	92.2	7.8	Pcg_9econ
Gone without cash many or most days	839	92.6	7.4	360	90.6	9.4	Pcg_10econ

4.3.2 Qualitative findings on girls' likelihood to excel or fall behind in transition

As shown under "*Other barriers identified through qualitative data analysis' (Section 3.3.2), q*ualitative findings show that transition in school for girls depends on several factors including:

- Propensity for girls to engage in sexual relationships with boys and men: As mentioned during FGDS with girls in Kajiado, Kilifi and Makueni Counties; a member of a school BOM in Kajiado who went as far as suggesting that girls should be in boarding schools to deal with this problem; a young mother in Kilifi during a FGD. These relationships sometimes lead to early pregnancies and therefore cause the girls to drop out from school. During FGD with teachers in Uasin Gishu, one teacher spoke about the school having lost 5 girls last year due to pregnancies. The teacher spoke of pregnancies as a crisis that needs to be addressed. The teacher in the mentioned FGD did not give any indication whether the particular five girls returned to school after giving birth or not.

- Social-cultural factors: which include early marriage where girls are married off early by their parents as mentioned by FGD with BOM in Kajiado; 2 FGDs with Boys, in one in Kilifi and another in Kajiado; FGD with girls in Makueni'; FGD Boys in Makueni; and in two different FGDs with Teachers in Uasin Gishu.

    - Where girls go through female genital mutilation (FGM) (mentioned in Uasin Gishu by a Chief), the expectation is that they would now be ready for marriage. Many girls quit school as soon as they undergo FGM because those who go through the rite, sometimes as young as 12 or 13 years old, drop out of school to marry and start a family[41].

- Economic challenges were mentioned as contributing to non-attendance of girls in schools by participants in all counties. In Kilifi, it was highlighted in 2 FGD with girls, one FGD with boys, and in one FGD with teachers. In Kajiado, 2 young mothers' during FGD spoke of poverty as a challenge. In Makueni, this was mentioned by one discussant in FGD with girls and in one FGD with BOM. In Uasin Gishu, in two FGD with teachers, it was expressed that girls give up continuing with their education due to lack of money to pay fees.

- Expectation of girls to do household chores than boys: During FGD with girls in Kilifi; IDI with parents who has been receiving stipends in Kilifi and Kajiado; two FGDs with BOM in Kilifi and FGD girls in Uasin Gishu, participants spoke of girls being required to do household chores and therefore not be in school. A BOM member said that some parents think of kitchen work as more important for girls than being at school.

[41] Kimonge H., 2011. Impact of Female Genital Mutilation on education of girls with hearing impairment in Gucha County, Kenya.

- Distances to schools: Only in Uasin Gishu was long distances to primary schools mentioned by 2 BOM members in different FGDs and a chief. In Kenya, there are more primary schools than secondary schools: 28,362 primary schools compared to 8,625 secondary schools[42], one expects the distances to be even longer to secondary schools.

- Insecurity: One parent, a recipient of stipends also in Uasin Gishu county spoke of it being unsafe for the girls to go to school very early when the maize plants are tall. This may apply also when the distances to be travelled are very far if a girl is to attend a day secondary school.

Local chief support: The support by the local chief has been seen as important in having the girls in school. Through the Chief's Act (Revised Edition 2012), Chiefs enforce the implementation of government policies in their jurisdiction. Among the chiefs who gave interviews, four out of eight of them were aware of their role to enforce the Free Primary Education (FPE) Policy put in place in 2003 by the government. These four individuals include two from Uasin Gishu, one from Kilifi and another from Kajiado. One of the Chiefs from Uasin Gishu said,

"*I am involved because in my barazas, our core function is to implement government policies. And the first government policy is about education. It is education and security. The children go to school, and they are secure at home and at school. Also, to sensitize the parents that this program is very beneficial to the children so that they can own these project plus their children".*

The case of a Chief in Kajiado, who had 29 girls returned to school after dropping out is an example of practise of this function by chiefs.

Last year I took back to school 29 children due to different reasons which had made them drop out of school. Some were involved in early marriage, I removed them from there and those reports made me earn an award; Public Service Servant Award. You have seen that photograph there, therefore I am involved immensely in the girl child education. I am very much involved in the iMlango programme. KII, Chief Ongata Rongai, Kajiado North

Parental Support: Girls who get support from their parents are also more likely to progress through school as shown by one young mother during FGD mothers in Kajiado.

What I can say women right now are contributing in the girls' education, in the past we used to see when the girls were undergoing their periods they stay at home because they are afraid. Nowadays I see the women working hard they buy those sanitary pads they make sure the child is going to school and then the workload when they come back in the evening you help them a bit if they have home work they do. You know in the past when the girl came from school you are the one to cook, to fetch firewood, you fetch water, but now the women have made it easier she helps you a bit and you also help her if she has homework she does it.

These issues vary from county to county and could inform regional differences that have been observed in the four counties being supported by i-Mlango. For example, according to the Kenya Primary Education Profile 2012, the transition rates of girls from primary to secondary school are highest in Uasin Gishu county at 42%, followed by Kajiado at 28%; and lowest in Kilifi and Makueni at 21%. The Examination pass rates of the four counties: Kilifi, Kajiado, Uasin Gishu and Makueni by mean scores (out of a possible 500 marks) for the KCPE 2016 were, respectively: 226, 258, 266 and 267[43]. The ranked positions of the four counties out of the 47 counties in Kenya was 40th, 14th, 5th and 3rd, respectively. Thus Makueni and Uasin Gishu performed very well relative to other counties in KCPE exam pass rates. This means that examination pass

[42] MOEST, Basic Education Statistical Booklet, 2014
[43] The Star Newspaper, 25th November 2017, reporting on the release of KCPE exam results by the then Cabinet Secretary for Education.

rates are inadequate to explain transition or otherwise to secondary schools as one would expect Makueni County to have the highest transition rate among the four, yet it had the lowest.

4.3.3 Cohort tracking and target setting for the transition outcome

The details of the girls in the evaluation group were collected during baseline for purposes of tracking these girls in subsequent data collection points. These details included their full names, date of birth, contact details of the schools and parents.

To set targets for transition, we have analysed the data collected from the benchmark group which are presented in Table 4-19. The results show that, the overall in-school progression among the 201 children in the benchmark group was 67.2%; overall movement to secondary schools was about 1%; and none dropped out of school or enrolled into TVET. The successful (positive[44]) transition rate for the entire benchmark group was 88.8% (calculated by adding together in-school progression, moves into secondary school, re-enrolment in school and enrolment to TVET). Results also show that the overall successful transition was highest among the 10, 16 and 5-7 years old group (100%) and lowest among the 13 years old group (80.0%). Perhaps this is because most of the girls in the 16-17 years old age group are already in secondary school and those most vulnerable could have already dropped out of school at this stage.

Table 4-19: Benchmarking for the Transition Outcome

	Benchmark group							
Age	**Sample size (#)**	**In-school progression %(n)**	**Moves into secondary school %(n)**	**Enrolled in TVET course %(n)**	**Drops out of school %(n)**	**Repeated grade % (n)**	**Re-enrolment %(n)**	**Successful transition rate per age %(n)**
5	1	100.0 (1)	0	0	0	0	0	100 (1)
6	2	50.0 (1)	0	0	0	0	50.0 (1)	100 (2)
7	4	100.0 (4)	0	0	0	0	0	100 (4)
8	24	75.0 (18)	0	0	0	16.7 (4)	8.3 (2)	83.3 (20)
9	26	65.4 (17)	0	0	0	7.7 (2)	26.9 (7)	92.3 (24)
10	18	50.0 (9)	0	0	0	0	50.0 (9)	100 (18)
11	27	51.9 (14)	0	0	0	14.8 (4)	33.3 (9)	85.2 (23)
12	28	82.1 (23)	0	0	0	14.3 (4)	3.6 (1)	85.7 (24)
13	15	66.7 (10)	0	0	0	20.0 (3)	13.3 (2)	80.0 (12)
14	17	64.7 (11)	5.9 (1)	0	0	17.7 (3)	11.8 (2)	82.4 (14)
15	15	53.3 (8)	0	0	0	6.7 (1)	40.0 (6)	93.3 (14)
16	12	91.7 (11)	0	0	0	0	8.3 (1)	100 (12)
17	8	75.0 (6)	0	0	0	12.5 (1)	12.5 (1)	87.5 (7)
Overall	**197**	**67.5 (133)**	**0.5 (1)**	**0**	**0**	**11.2 (22)**	**20.8 (41)**	**88.8 (175)**

Note: Re-enrolment refer to girls who were out of school last year and have re-enrolled this/subsequent year. No girl transited to employment. Successful transition per age = in-school progression + re-enrolment + moving to secondary school and joining TVET. Unsuccessful transition rate per age= repeating school

[44] Positive transition does not include girls repeating primary school grades

grade + dropping out of school. 8 girls were missing transition information in the benchmark group hence the total is 197 as opposed to 206 reported elsewhere in this report.

Table 4-20 show the targeted successful transition rate at midterm, which was generated using the outcome spreadsheet. Since the overall successful transition rates form intervention was 92.3% (Table 4-17), this mean that the project should target improving the rate for the intervention group by 5 percentage so as to achieve the set target of 97.3 % (92.3% + 5%). This assumes that the rate for the control group remains about the same across baseline and mid-term (89.5%, Table 4-18b) because the target is in terms of difference-in-difference (DID). If, for instance, the rate of the control group decreases at midterm, this means that the targeted successful rate for the intervention would need to be adjusted accordinglyto cater for this decrease and thus the rate would be below the value shown in Table 4-20. EE believes that a target of 5% (in terms of DID) is achievable at midterm. This target assumes that the political and environmental factors remain in the study counties remain about the same across baseline and next midline. The target for endline will be set after the midterm data collection.

Table 4-20: Target setting for transition outcome

	Midline	Endline
Target generated by the outcome spreadsheet	97.3 %	N/A

4.4 Sustainability Outcome

Following the GEC-T guidance on the sustainability scorecard, the baseline index was assigned to each of the sustainability indicators defined by the project at each level; school, community and system level. The results are shown in Table 4-21.

In order to assess this outcome, the perceptions of stakeholders on what they are doing/will do to ensure sustainability of iMlango project were sought. Respondents in KII and FGDs among headteachers, MoE officials, Boards of Managements of schools and area chief gave several responses to what they are doing and/or will do to ensure that the project gains are sustained in the communities. The understanding of sustainability is on the basis of GEC definition of sustainability: ie to sustaining the effects of the iMlango project like, maintaining computer labs once project ends, keeping the project running despite electricity costs, infrastructure provided by government or community resources, girls' clubs continuing to run, stipends being paid, maintaining a high attendance rate, high transition from grade to grade etc

Two headteachers spoke of a plan to have evening ICT classes in schools for the community and charge a minimal fee for sustainability.

In FGDs with BOMs, the members spoke of their current involvement with iMlango to include: engaging parents to contribute towards meeting the high electricity bills (Kajiado, Uasin Gishu); engaging the County Development Fund (CDF) where in one instance in Kilifi, the building housing the i-Mlango computer lab was constructed through CDF; employed an extra computer teacher (Kilifi); engaging the county governments (Kajiado, Kilifi, Uasin Gishu) in the project. In one instance the BoM (Uasin Gishu) said they will lobby the county government to build a bigger computer lab, as the response below shows.

One BOM member in Kilifi had this to say about engaging with county government
''County Education Officer has been here, in fact the Director himself, the subcounty director, the madam has been here for inspection and always they visit the iMlango project".

Discussants in FGD with BOMs spoke of engaging the county governments (Kajiado, Kilifi, Uasin Gishu) in the project and in one instance the BoM (Uasin Gishu) said they will lobby the county government to build a bigger computer lab, as the response below shows.

County Education Officer has been here, in fact the Director himself, the subcounty director, the madam has been here for inspection and always they visit the iMlango project (FGD BOM, Kilifi).

Future plans are to get County Government to help build a bigger lab (Uasin Gishu FGD BOM).

Table 4-21: Sustainability indicators and baseline score

Sustainability Indicator	Data Source	Wording	Baseline Index[45] (0-4)
School Level			
Indicator 1: % of school Board of Management (BoM) that are actively supporting the project	FGD BOMS	BOMs advise and follow-up with Headteachers on iMlango project. In one case (Kajiado), BOM employed an extra ICT teacher. In two schools (Kajiado and Kilifi) sBOMs have successfully mobilized parents to pay electricity bills. Two BOMs (Makueni and UG) have discussed about starting of IGAs to support iMlango: Poultry and tree planting. In Kilifi, BOM has had good working relationship with the County Education Officials but in two BOMs (UG and Kajiado), there has been little interaction citing that County MOE only deals with ECD in one case; and that BOM has not been directed about how to engage with County Education Officials in the other.	2.0
Indicator 2: Aspirations of female and male students in relation to their future education and career prospects	FGD Boys FGD Girls	The perception by both boys and girls is that iMlango has improved performance in general and in maths for girls in particular. There is improved self-esteem and confidence to express themselves. Their aspirations for the future are also bright with some aiming to be engineers and computer scientists. In a FGD in Kajiado, one discussant said there are 50 girls in her class who want to become doctors. Female and male students having aspirations for their future education and career prospects indicate a benefit beyond the project period. In their future professions, these students are more likely than other people to be ambassadors for ICT-based learning.	2.5
Indicator 3: Levels of confidence of school leadership in their ability to help sustain specific aspects of the intervention	KII HTs	Headteachers use the resources for reports on performance, attendance, monitoring of teachers' performances. Some use the wifiWi-Fi to send reports to MOE and TSC. Some use time-tables to ensure optimal use of Project resources. In Kajiado, HT has a student ''Cabinet Secretary'' in charge of IT, two schools have organised teachers' workshops where the iMlango champions train fellow teachers, one school (Kilifi) has meetings on Mondays and Fridays with teachers to review, some schools can effectively perform some maintenance of equipment internally. The HTs with the BOMs have engaged parents to support with electricity bills (in two cases (Kilifi and Makueni) parents give KES 100 to support electricity, water and payment of extra ICT teacher. Two HTs (Kilifi and Makueni) gave positive statements about their ability to sustain iMlango if program closes out-with government vote-heads, parentsparents' contribution, computer classes for the community at a fee and tree seedlings for sale in the school compound (already planted-Makueni). For many HTs electricity bills are a challenge as well as capacity to maintain the gadgets. They still heavily rely on iMlango technicians.	2.0

[45] Sustainability Index is based on the GEC-T MEL Guidance, page 48.

Sustainability Indicator	Data Source	Wording	Baseline Index[45] (0-4)
Baseline Score for school (0-4)			**2.17**
Community Level			
Indicator 1: Improvement in perceptions of parents and community leaders on the value of investing in girls' education	FGD Mothers FGD Fathers KII Chiefs	Many respondents to FGD fathers, mothers, KII Chiefs and IDI stipend parents see the value in educating girls. Most said that it is equally beneficial to educate both boys and girls. In only one case (IDI Stipend Parent, Kajiado) was there an expression that some in the (Maasai) community still prefer to educate boys rather than girls. The chiefs interviewed are aware of the Project and one won an award for helping return 29 girls back to school after being forcefully married in Kilifi. Their plans are to mobilize communities and ensure all girls are in school by using the 'nyumba kumi' (ten homes)[46] initiative and involve political leaders.	2.5[47]
Indicator 2: Income generated by the community for internet access	Project Data	This activity has not started yet. The technical work needed to integrate the payment system with the access controller has been completed and we are now finalising the testing.	
Indicator 3: Improvement in the perceptions of parents and community leaders to sending learners to schools that advocate for learning through technology	Household surveys	Parents responded to items on the quality of teaching practices in school and whether they have observed changes. In general, parents perceived the quality of teaching to have improved compared to before introduction of iMlango. During FGD with fathers and mothers, all the participants spoke of the advantages of learning through ICT. They include: ICT has made learning easier, learning is more interesting and has made the children want to attend school (using computers ''is like watching TV'' which captures the interest of the children, it's a good foundation for the children for their future; and ICT use in teaching has improved performance. One Stipend recipient in Makueni said, ''Reaching 250 marks was a problem. But now they have reached above 300". All the chiefs interviewed appreciate the use of ICT in learning and some (Uasin Gishu and Kajiado) promote it in chiefs' public meetings (barazas). One of the chiefs (Kajiado) had been consulted in identification of the needy students to benefit through stipends.	2.5
Baseline Score for community (0-4)			**2.5**
System Level			

[46] 'Nyumba Kumi' (ten homes) initiative was introduced by the government in 2012 to complement the community policing initiative which requires each person to ensure his safety and that of his neighbour. It is enforced through the local chiefs who work with village elders each in charge of ten homes.

[47] Score of 2.5 (or any other score with .5) indicates that the observed score in the sustainability matrix developed from the GEC-T MEL Guidance is higher than the last integer score (2) but not yet high enough for the next integer score (3). This flexibility allows for a higher precision in scoring.

Sustainability Indicator	Data Source	Wording	Baseline Index[45] (0-4)
Indicator 1: Advocacy of county level education officials (DEO & CSO) for changes to existing education system (policy, resources, processes) as a result of learnings from intervention	KII County MOE officials	The County MOE officials interviewed said that they have embraced ICT and use it in their day-to-day work. They encourage teachers in its use. The officials did not speak of any change to existing education policy as a result of learnings from iMlango but spoke of their appreciation of iMlango as a good fit to the existing ICT-integration policy and National Education Policy Project which have ICT as pillars. The ways in which they encourage ICT use include: during Board meetings(Kajiado), monitoring the use in schools (Kilifi)Meetings with teachers (Kilifi), conducting trainings on ICT for Teachers (Makueni, Uasin Gishu), making use of the government policy of ICT into learning to enforce (Makueni). However, only 3 MOE officials (Kilfi, Uasin Gishu and Kajiado) said they have an action plan to promote ICT use in their areas of jurisdiction.	1.5
Indicator 2: Levels of confidence of county level education officials (DEO & CSO) providing leadership and support ICT based teaching and learning approaches	KII County MOE officials	The county level education officials feel confident to provide leadership and support to ICT-based teaching. This is based on their assertion that they use the government policy of ICT integration in learning to encourage integration of ICT in schools (Kilifi, Kajiado, Uasin Gishu). The MOE officials see the ICT integration policy as making it easier for them to support the iMlango ideal than it would have been without the policy. The policy is an entry point. They also spoke of riding on the government rural electrification program to help schools embrace ICT. Some spoke of their positive experience in 'Tusome', the literacy content that is being provided by iMlango project in intervention schools. In Kajiado, one official said that he attends the BOM meetings and participates in discussions about iMlango. The officials also spoke of activities they have doingdoing undertaken in an attempt to support the project and plan on continuing in the future. They include: enforcing ICT-integration policy, riding on the government electrification program and involving the county government. The officials also mentioned that they have been riding on the ICT-integration policy and the government electrification program to support iMlango. They have also involved the county government to construct the ICT building hosting iMlango in some schools. One of the officials said he has no specific plan for iMlango as his role is for all the schools.	2.0
		Baseline Score for system (0-4)	**1.75**
		Overall Sustainability Score (0-4)[48]	**2.14**

[48] This is calculated as the average of the three level scores, i.e. (2.17+2.5+1.75)/3= 2.14.

However, a differing view was expressed in two FGDs in Kajiado and Uasin Gishu, the BOMs respondents said that they cannot engage the county governments because the role of county governments is Early Childhood Development (ECD) only. In Uasin Gishu it was expressed that iMlango has not engaged them and therefore the BOM has no direction on what to do.

At the level of our BOM, we have never interacted with any county official in regards to iMlango. So it is the principal who has that responsibility but us, we have never interacted with the county officials… And that is why we have not dealt with them because we do not know our boundaries when it comes to iMlango and more so being a pilot project. So I think that should have come from you and tell us, we need to do this as a BOM we need to get in touch with the ministry and so forth.

In the KII with MOE officials, the most mentioned strategies to ensure sustainability of the project was enforcing the National Education Policy Program (NEPP) "where ICT has been identified as one of the pillars that require investment to support education" (Uasin Gishu); Charge community minimal charge to access/learn ICT and collaborating with parents and other stakeholders. Some of the key informants said that they attend school board meetings where iMlango is discussed and they support. Some said they encourage use of ICT in schools as they enforce ICT integration policy and take advantage of the government electrification project to have the required infrastructure for ICT.

Yes. Within my position, I have influenced the use of ICT in my schools. I have 16 public schools, and what…in all my meetings, wherever I meet with teachers, with head teachers, whenever we are doing any type of seminar, I always encourage them to use the gadgets which are there in our schools (KII MOE, Makueni).

Recommendations made by the MOE officials to ensure project sustainability include adding other subjects apart from English and Maths, alternating iMlango champions to ensure more people gain knowledge; and training the administrators about the iMlango project so that they feel involved and own the project as well.

Among the Chiefs who participated in the KIIs, two said that they are aware of iMlango and speak about it in Barazas. Other mentioned that iMlango aims at ensuring all girls are in school by using the 'nyumba kumi' (ten homes) initiative, mobilising community support and involving political leaders. Some said that they would like to see every school in their area having the iMlango intervention.

Sensitize people so that when iMlango intervention is done in schools, it is able to pick up so that every school in the location has ICT. There are schools which just came into being recently and they are yet to be enrolled in such programmes. So we would like every school to be involved in this project. The government is making sure that all schools have electricity to enable facilitation of these equipment (KII Chief, Kilifi).

During the KII with chiefs, it emerged that some chiefs were aware of the iMlango project and have rendered and will continue rendering support in various ways including: sensitization of the communities during the chiefs' barazas (Kilifi), ensuring all girls are in school by using the' nyumba kumi' initiative (Kajiado), involving political leaders and lobbying to have ICT in every school (UG). It also emerged that inadequate learning by girls is caused by parents giving chores to them (IDI Stipend parents, Ganze) and being required to be home earlier than boys as shown in the below quotation,

Inadequate learning on the part of the pupil. For example, us girls, we are told when it reaches 6 p.m. you must be at home but there are some parents who don't take that responsibility of taking care of these girls (FGD Girls, Rabai).

Among the young mothers, it was observed a better attitude towards educating girls. In Kajiado, one young mother said that the monthly period is no longer a good reason for a girl to miss school as she ensures she has the sanitary towels, and also helps her daughter with homework in the evening.

In Kilifi, some parents force girls to marry early (FGD Boys Ganze) and some communities prefer boys to be in school more than girls as mentioned by two parents in Kajiado.

…it depends on….it depends on which community they come from. If it is the Masaai community, now some don't see the importance of the girl attending school (IDI Parent Kajiado).

As mentioned before, participants in different FGDs cited challenges related to culture: parents forcing the girls to early marriages were mentioned during FGD with BOM in Kajiado,2 FGDs with Boys in one in Kilifi and another in Kajiado; FGD with girls in Makueni'; FGD Boys in Makueni; and in two different FGDs with Teachers in Uasin Gishu.

In a FGD with boys in KilfiKilfi, one boy said:
"There are challenges that girls face for example some parents discriminate their daughters in the sense that this girl might be interested in learning but the parent forces her into early marriage".

We found two cases where a participants spoke of preference to educate boys rather than girls (both stipends beneficiaries in Kajiado). One of the parents spoke of his community (Maasai) preferring to educate boys as the girls will get married;

Honestly mostly we lean on the boy some of the time because you know the boy, sometimes the girl will get married and she will go to her house and maybe you will not be with this child for a long time. So mostly the higher percentage I can give like 70% and the girl maybe 50% so I will depend more on the boy child because I will have the boy child for a longer time and maybe he is the only dependent in my community to give my wealth and all other things but for the girl she will be cheated and leave and maybe she will not bother with me she will have other responsibilities there. IDI Parent Kajiado.

The following sub-section and Table 4-22 should be completed by the project.

Regarding the changes that need to happen to achieve the sustainability targets of the project, Table 4-22 provides the list of activities that are necessary.

Table 4-22: Changes needed for sustainability (project input)

	Community	School	System
Change: what change should happen by the end of the implementation period	Community members (including parents) understand the importance of the intervention in their schools and pressure at the school and county level for the intervention to be used and sustained. Parents understand the importance of education and prioritise sending their children to school.	Teachers able to deliver effective literacy and numeracy learning using ICT. Headteachers to be able to support teachers in their learning and use the data reports provided to improve school management and their everyday tasks.	County level officials act as advocates for the further uptake of the solutions provided through the iMlango project. These same officials are more confident in providing leadership and support for integration of ICT into teaching and learning.
Activities: What activities are aimed at this change?	1. Community outreach activities to sensitive parents on girls' education and inform them about the project 2. Engage with the BoM to ensure that they are aware of the project and are willing to help	1. Selection of 2 iMlango champions in every school who are trained to act as a resource in the school to train other teachers on using ICT for teaching; 2. CLA micro-courses on how to use the iMlango elements;	1. Strengthen the role of MOE and TSC in the project: Administration support to teachers, data sharing and feedback, teacher support in lesson delivery 2. Engagement with the TSC on champion

	Community	School	System
	3. Encourage communities and BoM to start IGA to sustain some elements of the intervention 4. Host parent days in the schools were they can see in action the project contributions to the school	3. Education advisor support (co-teaching, observation, co-planning, modelling) 4. Field Officer support (observations); 5. Headteacher engagement through leadership training and field officer visits	tracking in regard to transfer of teachers 3. Develop a comprehensive stakeholder engagement strategy 4. Align activities to project outcomes to the education policy
Stakeholders: Who are the relevant stakeholders?	Parents and wider community members	Teachers and headteachers	Sub-county directors, Curriculum support officers & QASO
Factors: what factors are affecting changes? Think of people, systems, social norms etc.	1. It can be difficult to engage with male members of the community; appropriate selection of venue is crucial 2. Fathers do not usually come to the school open days 3. Field officers need capacity building to ensure that they are delivering the right message to the parents/community members	1. Teacher transfers meaning that there are always new teachers that have to be trained on the project; 2. Teachers are overloaded with work and might find it difficult to change their ways of teaching 3. Headteacher buy in to the project and poor understanding of the data reports	1. Lack of stakeholder engagement activities with the consortium 2. Lack of a stakeholder engagement strategy 3. Lack of ownership of the project from community and stakeholders 4. Teacher transfer decisions making is an operational decision rather than a tactical or a strategic decision
Factors: what factors are helping achieve changes? Think of people, systems, social norms etc.	1. The community is in- need of support and social-capital. 2. Communities are aware of the push for girls' education.	1. The government is rolling out a digital literacy program- this is aligned with the project goal to use projects ICT infrastructure for in education 2. The project is in government schools with trained teachers and a centralized supervision systems hence easy to monitor.	1. Working closely with county governments. 2. Embedding intervention activities and materials to existing education system including approval by Kenya Institute of Curriculum Development (KICD).

Project's contribution

The project has identified the following key stakeholders that will enable results to be sustained:

- Parents and wider community: these are the key people influencing how norms affect school attendance but also holding responsible the school to ensure that it takes advantage of the iMlango interventions for maximising learning outcomes.
- Headteachers and teachers: they are the gatekeepers of the students' learning; teachers need to be encouraged to adopt the proposed tools and methodologies during the project's capacity building activities. Headteachers on the other side need to understand the offerings of the project

and buy in the positive outcomes that it can bring so that they can organise the running of the school to maximise learning and also use the data provided to run the schools better.

- County level staff (Sub-county directors, Curriculum support officers & QASO): policy implementation is driven by county level administration as well as direct evaluation of the work that the schools do through the CSO observations. It is important therefore for the local ministry officials to understand the project and support its implementation in the schools. This way they will be able to put pressure on the headteachers to resolve potential issues but also to take responsibility of driving the use of resources and improvement of teaching practices as per the training that has been delivered.
- Students themselves: it is important that the students have a positive view of what the intervention offers and for them to feel that it addresses their learning needs.

In Table 4-22 we have noted the changes that we would like to achieve in order for the outcomes to be sustained. Most of these map directly to the sustainability indicators that have been defined under the community, school and policy levels in Table 4-21.

We have also added an indicator that links to financial sustainability by leveraging paid for internet access for the community to offset the cost that the schools would have to pay for the internet if it was not part of the project. We believe that this indicator will provide useful insight in the financial sustainability dimension.

5. Key Intermediate Outcome Findings

5.1 IO 1: Improved attendance among certain pupil sub-sets in primary schools

5.1.1 Selection of indicators, methodology for measuring them, and relevant project activities

Indicators:

1. Average termly attendance rate for girls (and boys)
2. Percentage of students who are attending above the county level annual average as a result of a stipend
3. Percentage of students who are attending above the county level annual average as a result of the microloan (not relevant for baseline as the activity has not started)

Tools and methodologies:

Attendance data is collected through the project's attendance monitoring system (more details available in Annex 14), and will be supplemented by spot checks undertaken at each evaluation point from the EE and with one additional spot check from the field team per annum.

The attendance monitoring system is available in all treatment primary and secondary schools and can give attendance rates for a very large sample of girls and boys. It is not though applied in control schools and so cannot give a measure for those children. In addition, it can be linked to those receiving stipends and those receiving microloans which will inform indicators 2 and 3 of IO1.

Attendance spot checks at baseline were conducted by the EE in a total of 97 schools; 83 intervention and 14 control schools[49]. For each of the schools, one grade was chosen at random for the attendance spot check. The headcount number of girls and boys present at the time of spot check was recorded and compared with entries on enrolment in the class register to compute[50] the proportions reported in Table 5-1.

5.1.2 Findings

Indicator 1: Average termly attendance rate for girls (and boys)

(a) School attendance based on sQuid attendance monitoring system (project input)

Project's contribution

Gender and standard

The chart below shows that there is little variability in attendance between gender and standard, which is line with what we've previously reported during iMlango-1. The range of 2.8% from lowest (76.4% for standard 7 girls) to highest (79.2% for standard 8 boys) amounts to less than 2 school days' variability over the course of a term. When disaggregated by standard, we consistently see attendance levels maintained at the ~80% mark for both boys and girls.

Through discussions and interviews with various local stakeholders, household chores and pupil illness are the primary contributors to 1 in every 5 school days being missed. "Truancy" is sometimes cited as a reason as well, particularly by teachers. However, the phrase lacks clarity, and usually refers to pupil disinterest in attending school (poor teachers, inadequate infrastructure) and/or lack of parental vigilance over their

[49] Attendance spot checks were conducted in 83 intervention schools (2 short of the 85 target) due to field-work related issues. EE however conducted spot checks on 14 control schools to capture the attendance indicator.
[50] Students present divided by students enrolled.

child(ren)'s education. Class sizes are so large that teachers are often faced with the insurmountable task of following-up with absentees on an individual basis, despite automated provision of accurate, digital daily attendance reports.

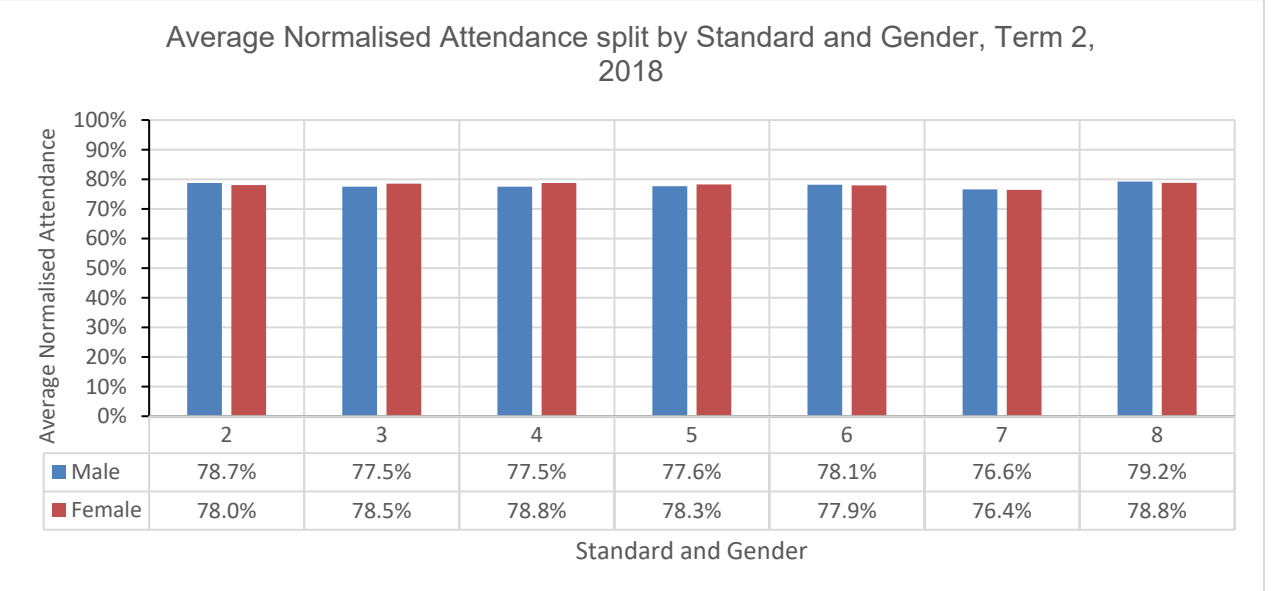


Figure 5-1: Normalised Attendance by Standard and Gender

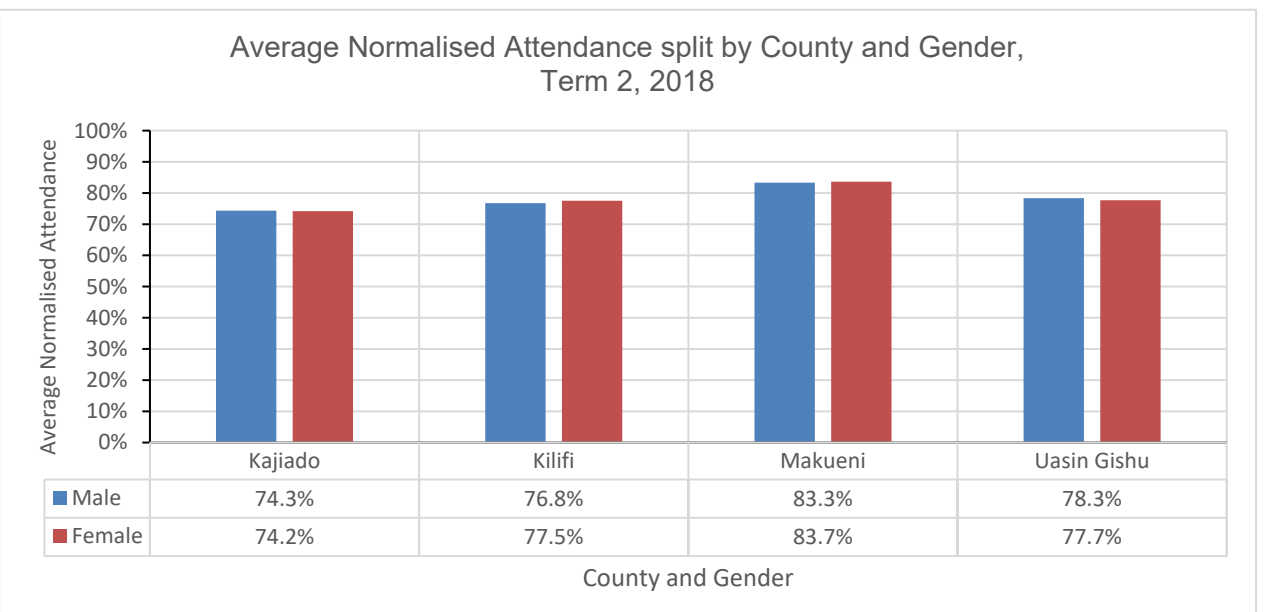


Figure 5-2: Normalised Attendance by County and Gender

Gender and county

In line with previous reports and Figure 5-2, Makueni's average normalised attendance is significantly higher than the other 3 counties. The other 3 counties are typically more comparable in terms of their attendance levels. Despite Makueni experiencing cross-cutting issues such as poverty, adverse, unpredictable weather conditions and over-populated schools, both boys' and girls' attendance rates are consistently higher in Makueni than the other 3 counties in which iMlango operates. According to key local education stakeholders (MoE county office, and interviews with all 37 project school administrations in the county), the higher

attendance levels observed in Makueni are largely attributable to the county's positive attitudes towards education, on a societal level. This is a difficult phenomenon to meaningfully quantify, but interviews with parents and head teachers have suggested that the perceived opportunity cost of not sending one's child to school is – on a county level – greater than in other counties. In other words, parents have indicated that in the long-term, they believe there is greater benefit to educating one's child over short-term, marginal income gain (manifested through higher attendance levels). This would appear to be somewhat confounding, as Makueni ranks higher than Kajiado and Uasin Gishu in terms of poverty levels[51]. One head teacher volunteered an explanation for this dynamic: while schools in Makueni are similar to schools in other counties with respect to infrastructure and staffing deficiencies, communities, at a minimum, try to ensure their children attend school as frequently as possible to maximise their chances of a good education. A good education is perceived as something that can transform the economic standing of a household. Several parents have claimed that this is widespread amongst the Kamba people, although the project is still exploring what exactly drives this positive cultural disposition to education.

Kajiado usually sees lower attendance levels than the other 3 counties, even if marginally lower than Kilifi's and Uasin Gishu's. We have schools that are situated in urban areas (Ngong, Ongata Rongai), which are susceptible to the negative effects of informal settlement dynamics, such as massively over-populated schools (Ongata Rongai Primary, as an example, has a population in excess of 2,000 pupils, with class sizes approaching 100 pupils in some standards), exposure to drugs and alcohol abuse, and the need to work to help supplement household income (e.g. scavenging for plastic in nearby rubbish-dumps). These dynamics, which for iMlango are felt most acutely in our Kajiado schools, are then starkly contrasted against schools situated in rural Masai land, some up to 3 hours from a main road (Elangata Wuas Primary, Magadi Primary). In such communities, a mixture of project observations and interview with local government officials and school administrations have yielded the following barriers to education: nomadic pastoralism is still the primary source of income generation, FGM is widely practiced, early marriage is prevalent, indifference to the benefits of education is present, and distances to travel to school are often substantial. More than 1/3 of iMlango's schools can be found at either end of this spectrum, resulting in a significant proportion of pupils facing pronounced adversities day-to-day.

Kilifi is the 9th poorest county in Kenya[52], and whilst there is significant variation in income levels within the county, the low median household income level impacts upon families' ability to send their children to school regularly. Kilifi is especially prone to drought, and combined with a predominantly agricultural economy-base, leads to periodic food and water shortages. In such times especially, children are often expected to assist with household subsistence at the expense of school. This is anecdotal evidence that has arisen out of conversations with parents (stipend recipients) and head teachers. Like in Uasin Gishu and Kajiado, the county – as a whole – has not yet embraced education to the extent Makueni has, which although hard to quantify, likely plays a role in their sub-par attendance levels. Uasin Gishu, although not as impoverished as Kilifi, suffers in certain areas – notably around Eldoret, the capital - from a similar key stakeholder (headteachers, teachers, community leaders) apathy, in promoting the values of education.

[51] KNBS and SID country report, Kenya, 2014

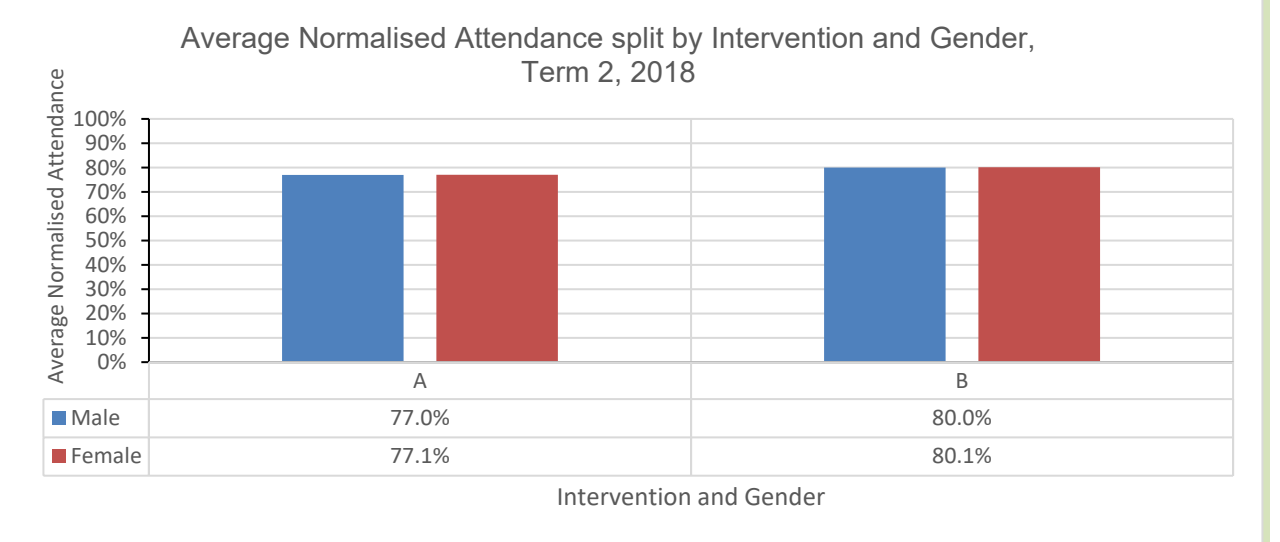


Figure 5-3: Normalised Attendance by Intervention and Gender

Computer laboratories in schools and stipends to needy parents

In Figure 5-3 above, Group A schools refer to all schools with a computer lab, which were previously distinguished into A and C schools – the former benefitting from the stipend support. Group B schools, whilst possessing no computer lab, have also been included in the stipend initiative since the start of GEC-T. With the stipend due to end imminently, analysis now centres around schools with a lab vs. schools without a lab.

However, we have consistently found C schools (those with a lab and no stipend) to possess lower average normalised attendance rates than their A and B counterparts. This is primarily attributable to the stipend, both directly and indirectly. Directly insofar as pupils who receive the stipend (especially those with attendance levels at <80%) consistently raise their attendance levels; indirectly in that there is possibly a positive externality being exerted on parental attitudes towards education, as a result of the community-oriented stipend. This deduction has been informed by project discussions with teachers and CSOs. Dialogue with the parents and school-level stakeholders around the stipend and its application has served as a form of sensitisation on the importance of education, and how regular attendance underpins strong academic performance.

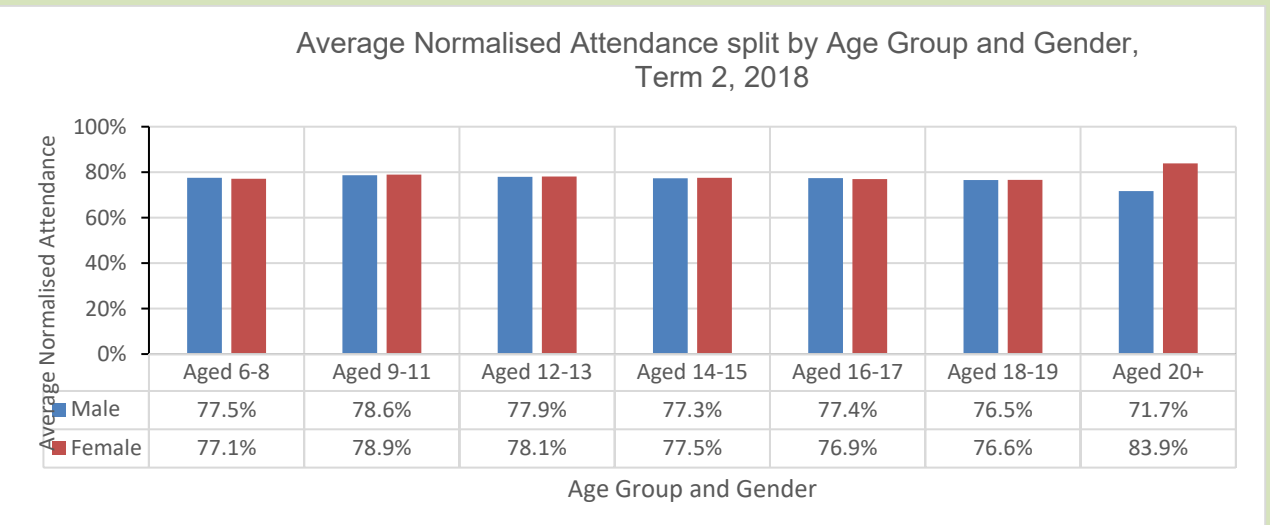


Figure 5-4: Normalised Attendance by Age group and Gender

Age and grade of the pupils

Figure 5-4 broadly mirrors the standard/gender disaggregation chart. with the exception of some pupils repeating a year or starting school late. It is also worth noting that age is self-reported by the pupils, so the exact age categories might not be completely accurate. From the 'Aged 9-11' category for girls, and the 'Aged 12-13' category for boys, there is a very gradual decline in average normalised attendances as pupils approach adolescence. This is to be expected, especially in the case of girls, where sometimes a lack of readily available sanitary towels and a stigmatisation against menstruation can lead to more frequent absences. Yet, as our data indicates, the decrease in girls' termly attendance once they reach adolescence is not as drastic as often perceived, with around 2 days more lost per term than their younger counterparts.

There was observed little variability in attendance between gender and standard, which corresponds to what was previously reported during iMlango-1. The lowest attendance was by standard 7 girls at 76.4% while the highest was for standard 8 boys at 79.2% -a range of 2.8%. This amounts to less than 2 school days' variability over the course of a term. When disaggregated by standard, we consistently see attendance levels maintained at the ~80% mark for both boys and girls.

(b) School attendance based on spot-check during data collection

Results from the spot check show that, overall, school attendance among students in intervention (91.0%) and control (91.2%) schools were about the same level, showing existence of baseline balance in school attendance (Table 5-1). In addition, school attendance among boys (91.0%) and among girls (91.1%) did not differ indicating gender balance in school attendance.

When the data was split by grade, results showed that school attendance varied substantially and was lowest among students in grade 5 (86.7%) and highest among those in grade 8 (95.6%). It is likely that grade 8 students recorded the highest attendance rate because they are involved in the national KCPE exams and thus could be keen on attendance. In terms of gender, school attendance did not differ much across the grades apart from among grade 8 pupils where attendance for girls (99.2%) was noticeably higher than that for boys (92.0%). These results seem to negate the expectation of low school attendance among girls because of household chores burden – this high attendance among girls could also be a result of the intervention.

Results further showed that school attendance varied by county, with Uasin Gishu (94.1%) and Kajiado (82.5%) recording the highest and the lowest rates, respectively. Attendance based on spot-checks during data collection was higher than that based on the sQuid attendance monitoring system both overall and when split by gender.

Table 5-1: Proportion of pupils in attendance during spot check

Disaggregation Category	Proportion of pupils in attendance during spot-check		
	Boys Mean (%)	Girls Mean (%)	Overall Mean (%)
Intervention Group			
Intervention (n=83)	90.8	91.2	91.0
Control (n=14)	92.0	90.4	91.2
Total (n=97)	**91.0**	**91.1**	**91.0**
Grade			
Class 1 (n=1)	100.0	80.0	90.0

Disaggregation Category	Proportion of pupils in attendance during spot-check		
	Boys Mean (%)	Girls Mean (%)	Overall Mean (%)
Class 2 (n=14)	89.8	93.9	91.8
Class 3 (n=5)	91.2	92.6	91.9
Class 4 (n=13)	89.2	90.5	89.9
Class 5 (n=16)	88.7	84.7	86.7
Class 6 (n=22)	92.1	90.6	91.4
Class 7 (n=18)	92.8	92.1	92.4
Class 8 (n=8)	92.0	99.2	95.6
Total (n=97)	**91.0**	**91.1**	**91.0**
County[53]			
Kajiado (n=13)	82.5	82.5	82.5
Kilifi (n=38)	90.8	91.5	91.2
Makueni (n=18)	92.9	91.3	92.1
Uasin Gishu (n=28)	93.9	94.3	94.1
Total (n=97)	**91.0**	**91.1**	**91.0**

Note: n = number of schools

(c) School attendance as reported by headteachers

In addition to the spot checks, headteachers from 16 intervention schools (A+B) were asked to give their perception regarding the level of school attendance among boys and girls in their schools. Results show that, in all four counties and across all grades, headteachers perceived school attendance to be above 70% - the full results are shown in the table below. In addition, they perceived attendance among boys to be generally about the same as among girls. These results corroborate school attendance rates observed during spot-checks.

Table 5-2: Headteacher assessment of pupil attendance

Attendance range as assessed by the headteachers		County				Total (%)
		Kajiado (%)	Kilifi (%)	Makueni (%)	Uasin Gishu (%)	
Class 1	**Girls attendance**					
	30-50% (n=1)	0.0	0.0	0.0	20.0	6.3
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=13)	80.0	100.0	100.0	60.0	81.3

[53] Spot checks were expected in all the 118 schools.

Attendance range as assessed by the headteachers		County				Total (%)
		Kajiado (%)	Kilifi (%)	Makueni (%)	Uasin Gishu (%)	
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=3)	20.0	0.0	0.0	40.0	18.8
	over 70% (n=13)	80.0	100.0	100.0	60.0	81.3
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 2	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 3	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 4	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5

Attendance range as assessed by the headteachers		County				Total (%)
		Kajiado (%)	Kilifi (%)	Makueni (%)	Uasin Gishu (%)	
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 5	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=4)	20.0	25.0	0.0	40.0	25.0
	over 70% (n=12)	80.0	75.0	100.0	60.0	75.0
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=3)	20.0	0.0	0.0	40.0	18.8
	over 70% (n=13)	80.0	100.0	100.0	60.0	81.3
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 6	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=3)	20.0	25.0	0.0	20.0	18.8
	over 70% (n=13)	80.0	75.0	100.0	80.0	81.3
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=4)	20.0	25.0	0.0	40.0	25.0
	over 70% (n=12)	80.0	75.0	100.0	60.0	75.0
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 7	**Girls attendance**					
	30-50% (n=1)	0.0	0.0	0.0	20.0	6.3
	50-70% (n=3)	20.0	25.0	0.0	20.0	18.8
	over 70% (n=12)	80.0	75.0	100.0	60.0	75.0
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=1)	0.0	0.0	0.0	20.0	6.3
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=13)	80.0	100.0	100.0	60.0	81.3
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Class 8	**Girls attendance**					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5

Attendance range as assessed by the headteachers		County				Total (%)
		Kajiado (%)	Kilifi (%)	Makueni (%)	Uasin Gishu (%)	
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Boys attendance					
	30-50% (n=0)	0.0	0.0	0.0	0.0	0.0
	50-70% (n=2)	20.0	0.0	0.0	20.0	12.5
	over 70% (n=14)	80.0	100.0	100.0	80.0	87.5
	Total (n=16)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(d) Triangulating from qualitative data

The perception of many of the respondents of the IDI stipend parents (2 in Kajiado, 3 in Kilifi, 2 in Makueni and 2 in Uasin Gishu) is that iMlango has improved the girls' attendance and performance in schools. One of the parents in Kajiado said that this is because the stipends have reduced the expenses. A parent in Kilifi said that the daughter is now performing very well and is indeed in the first position of her class.

In the FGD with fathers and mothers, all the participants spoke of how use of ICT has improved attendance. Among the sentiments expressed include: ICT has made learning easier, learning is more interesting and has made the children want to attend school (using computers ''is like watching TV'' which captures the interest of the children), it's a good foundation for the children for their future; and ICT use in teaching has improved performance. One Stipend recipient in Makueni said, ''Reaching 250 marks was a problem. But now they have reached above 300".

All the chiefs interviewed appreciate the use of ICT in learning and some (Uasin Gishu and Kajiado) promote it in chiefs' public meetings (barazas). One chief in Kajiado had this to say:

So my perception, ICT has brought help to ……..school because pupils like internet and ICT. Pupils like to attend school because of this project (KII Chief Uasin Gishu).

In FGD with teachers, their perceptions on the effect of iMlango on performance were similar. See below quotes from two teachers, one in Makueni and the other in Kajiado:

I can say we have seen many changes in pupils. I have seen pupils perform, pupils are able to read, they are able to write good composition because of the literature and the stories that they read. When it comes to Maths, the pupils who never liked Mathematics now are able to solve questions in Mathematics, they are enjoying the subject and they are ready to work. Because now they have come to like Maths and English because of the Maths Whizz and literature that they get by reading story books in the computers.
(Teachers FGD in Makueni).

Okay with me as I said earlier it has made my subject to be very interesting and real and my performance okay my subject performance, has gone up the mini score of what I teach has gone up compared to what they used to get before the coming of iMlango, yes.
(Teachers FGD in Kajiado).

Indicator 2: Percentage of students who are attending above the county level annual average as a result of a stipend

(a) Quantitative data provided by the project (project input)

Project's contribution

Stipend and attendance

The next 3 charts all demonstrate the effectiveness of the stipend on improving pupils' attendance levels by comparing recipients' attendance levels vs. county averages. Initially (in GEC 1), stipends were issued on a bi-weekly basis (amount of 500KES per disbursement), and the impact was immediate, particularly on pupils who initially had a low baseline attendance level (<80%) from the first phase of the project. This suggested that the economic barrier certainly played a role in preventing pupils' regular attendance, and through addressing this, households become more capable in supporting their children in school. As iMlango has transitioned into GEC-T, the disbursements have become less frequent (once per month during 2017; once per term during 2018), as we've gradually shifted the focus onto developing our microfinance initiative, which is designed to have greater impact over a longer period of time, and is also sustainable.

In light of this reduction in disbursement frequency, it is interesting to observe that a significant amount of pupil beneficiaries are still out-performing the average pupil in terms of attendance, since the more regular disbursement frequency. The stipend has been accompanied by regular follow-up and discussions with key stakeholders as to the importance of attendance underscoring optimum educational outcomes. This sensitisation work coupled with school support in positive communications to the parents of stipend recipients, may be developing amongst parents that had previously struggled to regularly support their children in school. This has been corroborated, in part, by discussions with parent recipients, although the work is sensitive and project field staff are not experts in qualitative data extraction. This could indicate that the financial barrier itself is only part of the problem, and in some cases households might perceive the problem to be greater than it is, especially if they do not see education as a critical step in poverty eradication.

Per the below disaggregation Figure 5-5 boys in Kilifi Group A schools represents the lowest cohort in terms of attendance performance vs. the county average at 64.8%. This means that that 35.2% of pupils in that cohort are not attending more regularly than the county average. Considering Kilifi has the highest poverty rates of the 4 iMlango operates in, it is telling that other than boys in B schools, the remaining Kilifi pupil cohorts are <70% with regard to performance against the county average. Through informal discussions with parents, field staff have fed back that the stipend amount cannot radically help households to overcome their income constraints preventing their children from attending school frequently. The fluctuations within a county and A/B schools are difficult to interpret, and further qualitative insights are required at group/county level to ascertain concrete findings. However, for Kajiado's B school category, 8/10 of the schools are located in urban or peri-urban areas where informal settlement dynamics are prevalent and poverty is more intensified. The head teacher from Nakeel Primary, an example of such a school, explained that the stipend amount is currently insufficient to alter poor household spending patterns enough to engender greater pupil attendance. This needs to be explored further in the remaining schools, but it is suggestive of possible reduced efficacy in boosting pupils' attendance. Kajiado's A schools are largely concentrated in more rural settings, or along the main highway to Tanzania, which struggle less with acute poverty.

There are no meaningful patterns or trends to be noted between A/B schools, nor between boys/girls in the below charts. There is a significant divergence in attendance between boys/girls in standard 2, in **Error! Reference source not found.** (a 21% difference). This is largely explainable by the fact that there are only 5 boys in this category, and 18 girls. With such small sample sizes, it's impossible to infer any type of source of causality or correlation. Otherwise, fluctuations in the below are largely predicated upon location of the school, and whether the recipient is part of a large family (if there are more dependents, then in-field observations indicate the size of the family generally correlates with diminishing efficacy of the stipend).

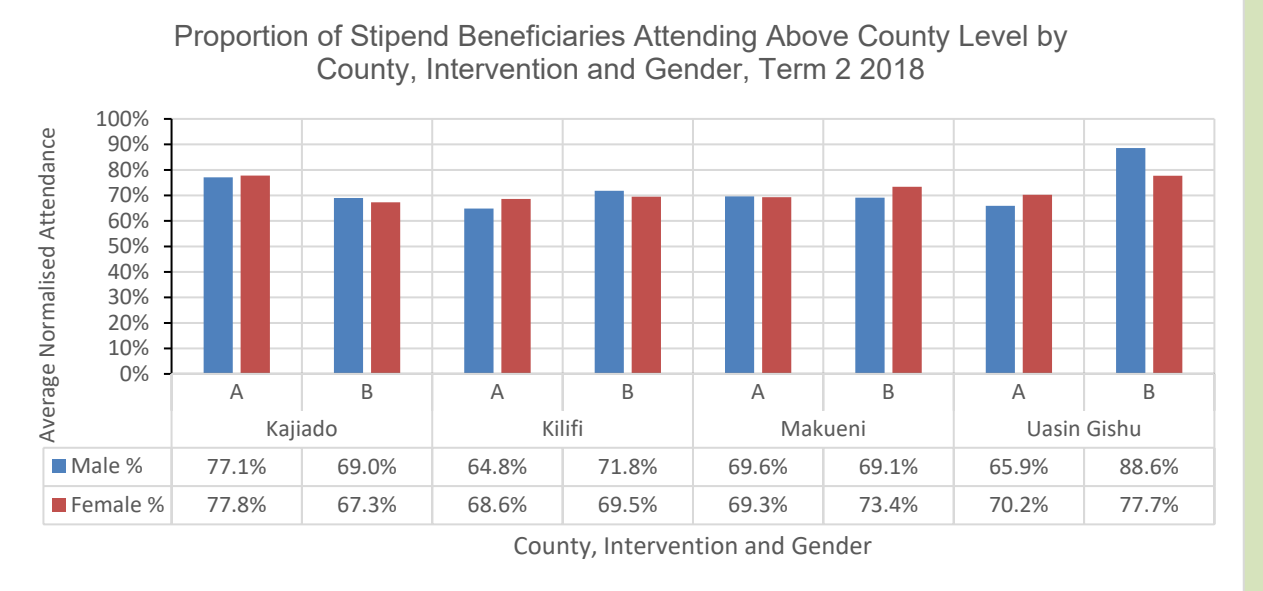


Figure 5-5: Proportion of Stipend Beneficiaries Attending Above County Level by County, Intervention and Gender

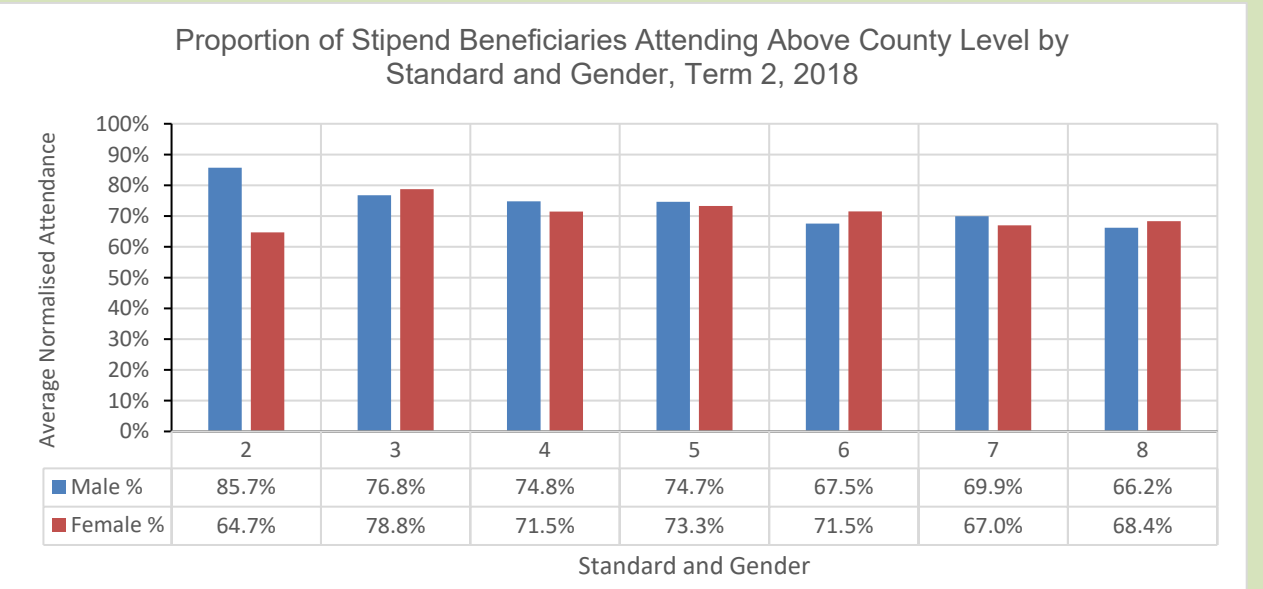


Figure 5-6: Proportion of Stipend Beneficiaries Attending Above County Level by Standard and Gender

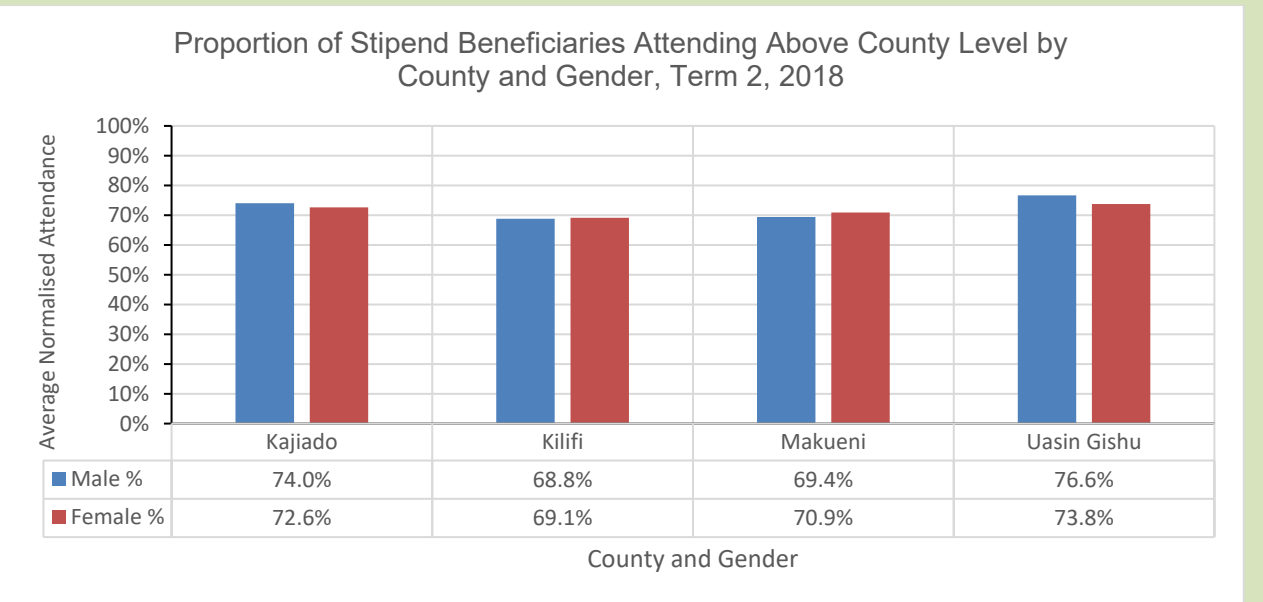


Figure 5-7: Proportion of Stipend Beneficiaries Attending Above County Level by County and Gender

Overall the stipend beneficiaries (based on iMlango-1) had better attendance rates compared to the county averages (see Figures 5-5 to 7-7) . Similary, after disaggregated data by gender, those who received stipend had better attendance rate than the county averages.

(b) Triangulating from qualitative data

IDI with parents receiving stipends (KES 500) showed that the stipends have helped to reduce the school levies burden on the parents resulting in improved attendance of the girls. On average, school levies range between KES 650 and KES 930, with lower grades paying less than upper grades. The overall average levied amounted to KES 726, meaning, slightly over one-third of the levy could be covered by the stipend. One grateful parent from Kajiado said, "First I am happy because uh…this school does not have that much expense in payment and being a business person I am a motorbike rider….". The parent meant that the stipend has reduced the school levies burden to what he (as a motor bike rider) can now afford. The stipend of KES 500 (about USD 5) which the parents and the girls would spend off a shop in the community had also been used to purchase other necessities for the girl apart from scholastic materials e.g. soap. Some responses from parents receiving stipends are presented below.

"And to be sincere the child is performing well. When the organization came here, we were told that every month they will be giving out food worth Sh500" (IDI Parents, Kilifi).

"And she is always in the first position since class one and is still keeping up that pace" (IDI Parent, Kilifi).

There were, however, parents whose children fail to get to school because of poverty. The levy called PTA (Parents Teachers Association) was mentioned in one instance as being burdensome to parents.

"Something like maybe lack of money- for now the only thing that is troubling us is PTA. That is the only thing" (IDI Parent, Eldoret West).

"Some usually give up in continuing with their education especially if their parents don't have school fees to pay for them" (FGD Girls Kajiwe, Kilifi).

5.1.3 Interpretation and reflections

Attendance, as an IO indicator is fit for the purpose (pathway) of showing the processes through which project outcomes (especially learning and transition) are achieved. Education literature shows an association between attendance and students' academic performance (Godttfried, 2010[54], 2014[55]; Oghuvbu, 2010[56]). Continuous attendance provides more opportunities for learning in school that occurs through interactions with teachers, peers, school textbooks, and equipment such as those in ICT labs. Furthermore, attendance is also associated with positive schooling outcomes such as grade progression and transitions to higher grades, with chronic absenteeism being a good indicator of those at risk of dropping out. Most studies rely on spot check observations to measure attendance (Banerjee, King, Orazem, & Paterno, 2010[57]). However, when the observation is done only at the time of data collection (as was the case in this study) it is advisable to complement with monitoring data collected using a similar approach. As a good practice, some literature recommend at least 3 spot checks over an academic year in the same grade in non-emergency contexts (IndiKit, 2018[58]). Fortunately for this study, the findings of the spot check were triangulated with headteacher responses and qualitative information from parents on the same issue.

Teachers and headteachers linked improved attendance to the project activities. In particular, they observed that life skills and the issuance of 'cards' reduced absenteeism and potential for dropping out among girls. As one young mother put it, project activities have been linked to a reduction in child labour hence improved school participation: *" … before, iMlango project, the children could wake up very early in the morning, go out looking for farm work so that they are able to get something to use at home. But when iMlango came in to the picture, I have not seen it happening again"*. The participants in the qualitative survey also associated school attendance with availability of food. They argued that since there was insufficient food at home, children were required to provide free family labour to supplement the meagre resources and especially work that would bring in food to the household. With the introduction of the project, food was available in school, hence no need to require girls to contribute to family labour during school time. Fathers who participated in FGDs in Kilifi also felt that introduction of ICT classes in school enhanced school attendance among girls. This could be as a result of creating interest in schooling.
The overall attendance rates observed at baseline are high for both boys and girls, however there is room for improvement. In particular, we note that grade 5 has the lowest attendance rates, especially for girls at 84.7%; monitoring data show that girls in grade 7 had the lowest (76.4%) attendance, though close to that of boys (76.6%) in the same grade.Given the negative association between attendance and risk of dropping out, it is imperative for the project to pay more attention to students who are in this grade as well as those transitioning to and from this grade. Overall, the non-attendance rate (based on spot check data) is low (about 9%) but these could relate to students who could experience problems either in school or at home and if targeted through monitoring and intervention by the project, the overall attendance rate could be increased moving forward.

[54] Gottfried, M.A (2010). Evaluating the Relationship Between Student Attendance and Achievement in Urban Elementary and Middle Schools. An Instrumental Variables Approach. *American Educational Research* Journal, 47(2) pp. 434-465. Available from https://eric.ed.gov/?id=EJ887169
[55] Gottfried, M.A (2014). Chronic Absenteeism and Its Effects on Students' Academic and Socioemotional Outcomes. *Journal of Education for Students Placed at Risk*, 19(2), pp. 53-75.
[56] Oghuvbu, E.P. (2010). Attendance and Academic Performance of Students in Secondary Schools: A Correlational Approach. *Studies on Home and Community Science*, 4(1), 21-25.
[57] Banerjee, R., King, E.M., Orazem, P., Paterno, E.M. (2010). Student and Teacher Attendance: The Role of Shared Goods in Reducing Absenteeism. Working Paper No. 10038, Iowa State University, Department of Economics.
[58] IndiKit (2018). Student Attendance Rate Outcome Indicator, Output Indicator. Available at https://www.indikit.net/indicator/6-education-and-skills/165-student-attendance-rate

Overall, attendance rates from spot checks data are higher (by about 13 percentage points on average) than those from the monitoring data. The spot check attendance had ranged between 82% and 95%, while that of monitoring data ranged between 74% and 84%. Similarly, the means were considerably different, at about 91% for spot check, compared to 78% for the monitoring data. At this point, it is not clear what the cause is but it is worth investigating the computational approaches and/or the timing including whether schools had advance knowledge of enumerators visits to schools to collect data – thus, encouraged students to attend school on the data collection day. However, in both datasets, Kajiado and Kilifi (in that order) have the lowest attendance rates. Furthermore, in the datasets, the differences between boys and girls attendance rates were small and similar (below 2 percentage points). Again in both datasets, girls have a small advantage in attendance, when compared with boys.

5.2 IO 2: Improved quality of teaching using ICT by the primary school teachers

5.2.1 Selection of indicators, methodology for measuring them, and relevant project activities

Indicators:

1. Percentage of teachers demonstrating effective use of ICT for whole class teaching
2. Percentage of teachers demonstrating effective use of ICT for guiding personalized learning by students in the lab
3. Percentage of teachers that feel their teaching and learning practices have improved as a result of training and support

Tools and methodologies:

This indicator is focused on the primary schools as they will be the focus for training and capacity building to enable ICT integration in teaching. In the secondary schools the activities will be targeted towards ensuring a minimum level of support for students that have gaps from their primary school education. The project is still defining its approach to the CIHs but most probably the focus will not be on teaching literacy and numeracy with the use of ICT.

The measure of teacher proficiency using ICT was undertaken by three key methods – through classroom observations, through a survey of teachers, and through interviews with teachers and headteachers. The classroom observations informed indicator 1 on how well the use of the whole class resource is utilised. These observations were for classes that use literacy or maths content on the day the EE visited the school. The assumption here was that when the EE's enumerators visit schools for the qualitative assessments, at least one class in the day(s) would utilise the resources and be available for observation.

For the use of ICT in personalised learning, observations were also undertaken of the use of the lab by the EE. In addition, a survey with teachers was applied and interviews undertaken. These sought to measure the effective use and management of the lab time. A minimum standard was developed with a clear tool for defining what "effective use" meant – this included how the teacher managed the split between supervision of the whole class and the lab, the equitable sharing of ICT lab time between classes and within classes (in particular between girls and boys), as well as how the teacher ensured that lab time is used effectively with specific goals in place for the time spent and data on progress utilised.

For the qualitative indicator 3 the EE conducted FGDs to find out teachers' perceptions on the impact of the intervention on their teaching and learning practices. A focus on the efficacy of the ICT champions and the cascade effect to all teachers was also explored.

5.2.2 Findings

Indicator 1: Percentage of teachers demonstrating effective use of ICT for whole class teaching

Table 5-3 – Table 5-5 provide the context within which whole class teaching took place by presenting the LOI during lesson time, whether the teacher was trained by the project, and effective use of ICT during whole class teaching.

Table 5-3 presents the LOI during classroom lesson time in treatment and control schools. Overall, over 70% of classroom lessons in both treatment and control schools were instructed in English – a common phenomenon in Kenyan schools. Nearly one quarter of the lessons in both treatment and control schools used Kiswahili during instruction time – majority of these were observed in Kilifi where Kiswahili is a common medium of communication within the population. Only 1 class lesson (in a treatment school) was observed instructing learners in mother tongue (Kalenjin) in Uasin Gishu county.

Table 5-3: Classroom observation - language of instruction[59]

	Intervention						Control		Total	
	Group A #lessons	%	Group B # lessons	%	Group C # lessons	%	# lessons	%	# lessons	%
English	9	90.0	14	60.9	1	100.0	6	60.0	36	70.5
Kiswahili	1	10.0	8	34.8	0	0	4	40.0	14	27.5
Kalenjin	0	0	1	4.4	0	0.0	0	0	1	2.0
Total	10	100.0	23	100.0	1	100.0	10	100.0	51	100
Cases/schools	34						7		41	

In Table 5-4, we present the status of teacher in-service training by the iMlango project, especially on the use of the ICT infrastructure. In the treatment schools with ICT lab (lessons were observed during ICT instructions), slightly over half of the teachers observed had been trained by iMlango on the use of ICT infrastructure. The EE sought to establish if there was any contamination in this activity by finding out from some selected teachers in control schools if they had been trained by iMlango. It turned out that none had been trained by iMlango.

Table 5-4: Classroom observation – teacher attributes

Training Status	Intervention		Control		Total	
	# of lessons	%	# of lessons	%	# of lessons	%
Yes	18	52.9	0	0	18	43.9
No	16	47.1	7	100	23	56.1
Total	34	100	7	100	41	100

Table 5-5 presents teachers' perception on the effectiveness in the use of ICT infrastructure. Though the focus of the ICT intervention was treatment schools (group A+C schools), the EE asked same ICT use questions to teachers in some selected control schools to check for the possibility of contaminations. It turned out that some teachers in control schools have been exposed to ICT infrastructure. This could have happened due to transfers from treatment schools to control schools within a county and/or through the government's sponsored digital literacy program that targets all public primary schools.

[59] The table 2-5, presents the expected target sample for lab observations and whole class observations, in total 52. The table 5-3 presents the actuals achieved, in total 34. The discrepancy is attributed to difrence between achieved and exceeded the targets.

Looking at the use of ICT for whole class teaching in intervention schools, over 90% of teachers indicated they use ICT for whole class teaching with about 43% using the iMlango portal every week. Teachers also indicated that they use the ICT platform data to support lesson planning and student assessment, with about 42% of teachers interviewed indicating they use the iMlango portal every week. From Table 5-5 we can conclude that there is high utilisation of ICT infrastructure by teachers in the intervention schools, and a considerable proportion (four in every ten teachers) use it every week.

Table 5-5: Effective use of ICT during whole class teaching

	Intervention						Control	%	Total	%
	Group A	%	Group B	%	Group C	%				
Teacher have been using ICT for whole class teaching (TQ3)										
No	4	9.1	7	11.7	2	3.6	11	78.6	24	13.6
Yes	40	90.9	53	88.3	48	96.0	3	21.4	152	86.4
Total	44	100.0	60	100.0	56	100.0	14	100.0	176	100.0
Teacher uses iMlango portal for whole class teaching in the classroom (TQ8)										
Used it sometimes	7	15.9	14	23.3	13	23.2	0	0.0	37	21.0
No, doesn't use it	2	4.6	2	3.3	2	35.7	2	14.3	8	4.6
Yes, every week	22	50.0	25	41.7	15	26.8	65	40.6	66	37.5
Yes, few times per month	11	25.0	13	21.7	16	28.6	0	0.0	41	23.3
Total	44	100.0	60	100.0	56	100.0	14	100.0	176	100.0
Teacher uses iMlango ICT platform data to support lesson planning and student assessment (TQ10)										
Used it sometimes	9	20.5	15	25.0	7	12.5	0	0.0	33	18.8
No, doesn't use it	2	4.6	7	11.7	4	7.1	2	14.3	15	8.5
Yes, every week	17	38.6	25	41.7	17	30.4	0	0.0	63	35.8
Yes, few times per month	14	31.8	7	11.7	18	32.1	0	0.0	41	23.3
Total	**44**	**100.0**	**60**	**100.0**	**56**	**100.0**	**14**	**100.0**	**176**	**100.0**

Note: This data was collected from the teacher's survey

In Table 5-6a and 5-6b, we use lesson observations data from treatment schools to report the proportion of teachers whose teaching and learning practices have changed after exposure to iMlango. As was the case with other observation items, lessons in some selected control schools were observed to check for possible contamination of the intervention and/or improve our understanding of the baseline status in control schools on observations of interest. As would be expected, in all lessons observed, teachers asked questions to learners, with teachers in over 94% of the observed lessons answering learners' questions as would be required. While answering learners' questions, teachers did so with respect regardless of the learner's gender though there was an incident in a treatment school where a response to a male learner was not done with respect. In treatment schools, teachers allowed all learners to ask questions regardless of their status – gender or disability. This data implies that teachers were fair and respectful in the way they treated their learners regardless of gender or disability.

Qualitative data show that headteachers were cognizant of pupils with disability even where their school did not have such pupils. For instance, a head teacher in Uasin Gishu narrated what actions need to be taken to make learning environment for pupils with disability conducive. Such actions included having the right teacher with necessary skills, and providing sanitation facilities that are friendly to pupils with disability. Teachers were also keen to ensure smooth integration of pupils with disability with the rest of the school population. They did this by sensitizing the school population on disability using messages such as 'disability is not inability'. They also emphasized the fact that pupils with disability have talents that no other pupil may have.

Table 5-6a: Classroom observations on teacher-learner interactions

Question	Intervention		Control		Total	
	N	%	N	%	N	%
CL. 15. The teacher is asking questions to the learners						
Yes	34	100	7	100	41	100
Total	**34**	**100**	**7**	**100**	**41**	**100**
CL 19. The teacher answers the learners questions respectively						
Yes	32	94.1	7	100	39	95.1
No	2	5.9	0	0	2	4.9
Total	**34**	**100**	**7**	**100**	**41**	**100**
COL 20. The teacher is answering the questions from female learners with respect						
Yes	34	100	7	100	41	100
Total	**34**	**100**	**7**	**100**	**41**	**100**
CL 21. The teacher is answering the questions from male learners with respect						
Yes	33	97.1	7	100	40	97.6
No	1	2.9	0	0	1	2.4
Total	**34**	**100**	**7**	**100**	**41**	**100**
CL 25. The teacher is providing individual support to learners at task						
Yes	21	61.76	6	85.71	27	65.85
No	13	38.24	1	14.29	14	34.15
Total	**34**	**100**	**7**	**100**	**41**	**100**
CL 26. The teacher is allowing learners to ask questions, irrespective of their gender, disability						
Yes	34	100	6	85.7	40	97.6
No	0	0	1	14.3	1	2.4
Total	**34**	**100**	**7**	**100**	**41**	**100**

Note: N refers to the number of teachers

Table 5-7b: Class room observations on teacher's skills in use of iMlango ICT resources

Question	Intervention		Control		Total	
	n	%	n	%	n	%
CL 29 Teacher able to use Maths-Whizz Tutor						
Yes	2	5.9	0	0	2	4.9
No	32	94.1	7	100.0	39	95.1
Total	**34**	**100.0**	**7**	**100.0**	**41**	**100.0**
CL 29 Teacher able to use projector						
Yes	2	5.9	0	0	2	4.9
No	32	94.1	7	100.0	39	95.1
Total	**34**	**100**	**7**	**100.0**	**41**	**100.0**
CL 29 Teacher able to use computer						
Yes	3	8.8	0	0	3	7.3
No	31	91.2	7	100.0	38	92.7
Total	**34**	**100.0**	**7**	**100.0**	**41**	**100**

Note: N refers to the number of teachers

At midline, the EE will generate data on the proportion of teachers who feel their teaching and learning practices have improved as a result of training. That said, teachers had an opportunity to express their perceptions on the quality of teaching during the qualitative data collection. During classroom observations, the EE also explored the availability of lesson plans, and whether the teacher provided individual support to learners. Out of the 34 teachers observed in intervention schools, 67.65% had lesson plans; another 61.76% provided individualised support to learners at task. The few observations made in control schools also showed similar presence of lessons plans (that is 4 out of 7 teachers) and provision of individualised support to learners (6 out of the 7 teachers).

Indicator 2: Percentage of teachers demonstrating effective use of ICT for guiding personalised learning by students in the lab

Table 5-8 presents teachers' perception on their effectiveness in the use of ICT to learn and provide personalised instruction to their learners. Looking at the use of ICT for own learning among teachers who were interviewed from treatment schools, slightly over 40% of teachers indicated they use ICT for own learning every week; with another 29.1% using it a few times per month. The baseline observed a huge (92.5%) proportion of teachers in treatment schools who use ICT for personalised learning by students. Further, almost two in every three teachers interviewed from treatments schools took students to the ICT lab for individualised tutoring. From these observations, and using the items in Table 5-6 as proxies for effective use of ICT, it would be fair to say that over two-thirds of teachers in intervention schools are effectively utilising ICT for learning and personalised teaching.

Table 5-8: Effective use of ICT for own learning and personalised teaching

Question	Intervention		Control		Total	
	N	%	N	%	N	%
Teacher uses iMlango portal for their own personal learning (TQ7)						
No, doesn't use it	7	4.7	2	100.0	9	6.0
Used it sometimes	38	25.7	0	0.0	38	25.3
Yes, few times per month	43	29.1	0	0.0	43	28.7
Yes, every week	60	40.5	0	0.0	60	40.0
Total	**148**	**100.0**	**2**	**100.0**	**150**	**100.0**
Have you been using ICT for guiding personalized learning by students in the lab? (TQ4)						
No	12	7.5	12	85.7	24	13.8
Yes	148	92.5	2	14.3	150	86.2
Total	160	100.0	14	100.0	174	100.0
Teacher takes students to the lab to use individualized tutoring (TQ9)						
No, doesn't use it	17	11.5	2	100.0	19	12.7
Used it sometimes	16	10.8	0	0.0	16	10.7
Yes, few times per month	21	14.2	0	0.0	21	14.0
Yes, every week	94	63.5	0	0.0	94	62.7
Total	**148**	**100.0**	**2**	**100.0**	**150**	**100.0**

Table 5-9 presents observations on the adequacy of ICT infrastructure in treatment schools. Regarding the functioning of computers and projectors, about 60.7% of the lessons observed had equipment that was in good working condition. All the equipment was in good working condition, in a considerably large proportion

(35.7%) of the observed lessons. In slightly over half of the lab lessons observed, students' seating space and number of learners per computer were 'just adequate'.

Table 5-9: Adequacy of ICT infrastructure

Question	Number of lessons	%
Do the ICT equipment (computers and the projector) in good working condition		
Yes, all of them	20	35.7
Yes, most of them	34	60.7
Yes, but very few of them	2	3.6
Total	**56**	**100**
Space available for learners		
More than enough space	17	30.4
Just adequate	29	51.8
Too squeezed	10	17.9
Total	**56**	**100**
Number of students per computer		
Few students per computer	10	17.9
Just adequate no of students per computer	29	51.8
Too many students per computer	17	30.4
Total	**56**	**100**

Table 5-10 presents LOI during laboratory observations in treatment schools (ICT labs were only in treatment schools A+C). As was the case in classroom instructions, most (two-thirds) lab lessons in the ICT laboratories were conducted in English. In Kenya, teachers tend to use the 'language of the examination' as the LOI – in this case it happens to be English, hence this was expected.

Table 5-10: ICT Laboratory observation - language of instruction

LOI	# of lessons	%
English	52	66.67
Kiswahili	25	32.05
Kalenjin	1	1.28
Total	**78**	**100**

Table 5-11 presents teachers' perceptions on training received, the iMlango literacy contents and its contribution to learning among pupils, and the individualised tutoring mode on the Maths-Whizz tutor. In each of these three areas, majority of teachers 'strongly agreed' that these three areas have improved their skills, contributed to learning and enhanced numeracy skills, respectively. This could be an indication of possible effectiveness of the activities of iMlango project.

Table 5-11: Teachers' perceptions on iMlango training, literacy contents and Maths-Whizz tutor

Question	Intervention	
	N	%
The training I have received so far by iMlango has improved my teaching skills and impacted on the pupils' learning (TQ16)		
Strongly agree	87	59.6
Agree	53	36.3
Not sure	5	3.4
Disagree	0	0.0
Strongly disagree	1	0.7
Total	**146**	**100.0**
The iMlango literacy content has contributed to learning by the pupils (TQ17)		
Strongly agree	88	60.3
Agree	54	37.0
Not sure	2	1.4
Disagree	0	0.0
Strongly disagree	2	1.4
Total	**146**	**100.0**
The Maths-Whizz Tutor(individualised tutoring mode for students) has enhanced numeracy skills in my pupils (TQ18)		
Strongly agree	83	56.9
Agree	56	38.4
Not sure	5	3.4
Disagree	1	0.7
Strongly disagree	1	0.7
Total	**146**	**100.0**

Indicator 3: Percentage of teachers that feel their teaching and learning practices have improved as a result of training and support

(a) Triangulating quality of teaching from qualitative interviews with teachers and survey with girls

presents length of stay in the current station, use of ICT in whole class teaching and use of iMlango platform to support lesson planning and assessment. From the table, it turns out that two in every three teachers in the intervention schools have remained in their current work station for more than 3 years; there was also a strong indication of the use of ICT in whole class teaching, with slightly over 90% of teachers in group A schools confirming that they do this. For the teachers who used ICT for whole class teaching, over half (55%) said they do so very effectively, with another 41% indicating that they do so 'somehow effectively'. Though there is room for more improvement, these are reasonable proportions indicating that use of ICT for whole class teaching is effective, at least according to teachers' perceptions.

Table 5-12: Teachers duration of teaching in-station, effective use of ICT and iMlango platform

Question	Intervention	
	N	%
TQ 2: How Long have you been a teacher in this school?		
More than 3 years	107	67.7
2-3 years	22	13.9
1-2 years	17	10.8
Less than a year	12	7.6
Total	**158**	**100.0**
TQ3: Have you been using ICT for whole class teaching?		
Yes	145	91.8
No	13	8.2
Total	**158**	**100.0**
TQ3a: How effectively have you been using ICT for whole class teaching (If YES in TQ3)		
Very effectively	80	55.2
Somewhat effectively	60	41.4
Not effectively	5	3.5
Total	**145**	**100.0**
TQ 10: I use iMlango ICT platform data to support my lesson planning and student assessment		
Every week	62	42.5
Few times per month	40	27.4
used it sometimes	31	21.2
Don't use it at all	13	8.9
Total	**146**	**100.0**

As seen from Table 5-13, the majority of teachers strongly agreed that the ICT support received from iMlango and the training have been useful in improving their teaching skills and practices. This could imply that the support and training is making them effective. This could be supported by an item that sought to find out if the support for teachers has led to increased learning by pupils. Almost all the teachers either strongly agreed or agreed that this has happened.

Table 5-13: Teachers' attitude on use of ICT and iMlango training

Question	Intervention	
	N	%
The support I receive as a teacher in the use of ICT for teaching has improved my teaching skills and practices (TQ11)		
Strongly agree	93	63.7
Agree	53	36.3
Not sure	0	0.0
Disagree	0	0.0
Strongly disagree	0	0.0
Total	**146**	**100.0**
The training provided from iMlango so far is useful and relevant for me (TQ12)		
Strongly agree	113	77.4
Agree	31	21.2
Not sure	2	1.4
Disagree	0	0.0
Strongly disagree	0	0.0
Total	**146**	**100.0**
The iMlango literacy content is useful and relevant for me (TQ13)		
Strongly agree	106	72.6
Agree	40	27.4
Not sure	0	0.0
Disagree	0	0.0
Strongly disagree	0	0.0
Total	**146**	**100.0**

(b) Triangulating quality of teaching from qualitative interviews with teachers and survey with girls

FGD with teachers

During the FGD with teachers, they expressed that ICT has helped them in lesson planning, provided a source of information through googling, enhanced the TSC Program called T-pad; and made teaching easier and interesting for both teachers and pupils.

"Made teaching easier to me now it is interesting, it has made my work easier, now instead of even now explaining how the ark looks like (CRE lesson) now they could see. To me I say it is an added advantage it has made my work easy" (FGD Teachers, Kajiado)

"Now if it is mathematics subtraction, they give the whole number then they subtract one, one, the girl child is just looking at this like, it's like a movie the children really they like it and they understand it better than the teacher explaining or using the chalk board" (FGD Teachers Makueni)

According to the teachers, ICT has increased their skills as some of them were not even conversant with the use of computers before (Uasin Gishu). Their newly acquired ICT language has helped them to do other jobs

that they could otherwise not do with the example that teachers got part-time jobs with the IEBC during the 2017 elections.

The teachers also said that they apply the strategies they have learned in other lessons even those that are not ICT-based.

"And even the place value they really show them very well even the teacher really enjoys and you get the strategies of teaching even when you are not having a lesson in the computer lab, you can use the same strategies that are shown in the computer to teach them in the classroom very interesting, yeah" (FGD Teachers, Makueni).

Perceptions on quality of teaching based on survey with girls

Perceptions of the girls interviewed regarding teaching quality are shown in Table 5-14. Thus, regardless of the study group, a vast majority of the girls (over 90%) reported that teacher preferred asking questions equally to boys and girls, and that the preference for asking hard questions was not biased against any gender.

Over one-half of the girls in the intervention (56.9%) and control (59.7%) group reported that teachers often used different language (other than English) to help them understand lesson content. On the other hand, three in every four girls in the intervention (76.3%) and control (76.0%) reported that teachers often encouraged students to participant during lessons (for instance by answering questions). Moreover, nearly 90% of the girls in both intervention and control groups reported that teachers gave them suggestions on how they can continue to study after school. Thus, in general, these results show existence of baseline balance in perceptions of the girls regarding the quality of teaching.

Table 5-14: Girls' perceptions on teaching quality

Question	Intervention		Control		Total	
	N	%	N	%	N	%
tq_1s: Teacher asking questions preference						
Boys	64	2.4	19	1.8	83	2.3
Girls	166	6.3	48	4.6	214	5.8
Equally to boys and girls	2,391	91.0	963	93.1	3,354	91.6
Don't know	8	0.3	4	0.4	12	0.3
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**
tq_2s: Hard questions preference						
Boys	116	4.4	42	4.1	158	4.3
Girls	127	4.8	30	2.9	157	4.3
Equally to boys and girls	2,367	90.0	956	92.5	3,323	90.7
Don't know	19	0.7	6	0.6	25	0.7
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**
tq_3s: Teacher use different language to help you understand						
Often	1,497	56.9	617	59.7	2,114	57.7
Sometimes	832	31.7	303	29.3	1,135	31.0
Rarely	151	5.7	56	5.4	207	5.7
Never	138	5.3	55	5.3	193	5.3
Don't know	11	0.4	3	0.3	14	0.4

Question	Intervention		Control		Total	
	N	%	N	%	N	%
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**
tq_4s: Teacher encourage student						
Often	2,007	76.3	787	76	2,794	76.3
Sometimes	535	20.4	207	20.02	742	20.3
Rarely	56	2.1	30	2.9	86	2.4
Never	17	0.7	5	0	22	0.6
Don't know	14	0.5	5	0	19	0.5
Total	**2629**	**100.0**	**1034**	**100**	**3663**	**100**
tq_5s: Teacher suggest after-school study						
Yes	2,351	89.4	929	89.9	3,280	89.5
No	249	9.5	96	9.3	345	9.4
Don't know	29	1.1	9	0.9	38	1.0
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**

The girls' perceptions on the quality of teaching was also captured in the FGD with girls in which they viewed ICT as an alternative to the Classroom teaching as shown in the quote below from an FGD with girls in Makueni.

It has helped us, let's say if a girl fears to ask a male teacher about Mathematics and she did not understand what the teacher taught, you might go and get taught with Maths Whizz, if a girl fears to tell the teacher she has not understood, if they are given Maths Whizz and she checks, it always helps us a lot and it helps girls to understand what the teacher was teaching.

Table 5-15 reports girls' perceptions on quality of teaching based on their experience on classroom management practices. The practices focused on how teachers maintained discipline in class, and methods used by teachers to punish errant students. Over 83% of girls (83% in treatment and 85% in control schools) reported that teachers punished errant student, with physical punishment being the most common form of punishment to errant students.

Table 5-15: Girls' perceptions on classroom management

Question	Intervention		Control		Total	
	N	%	N	%	N	%
tq_6s: Teacher discipline/punish if wrong						
Yes	2,181	83.0	882	85	3,063	83.6
No	443	16.9	150	15	593	16.2
Don't know	5	0.2	2	0	7	0.2
Total	**2629**	**100.0**	**1034**	**100**	**3663**	**100**
How teachers punish students - tq_7sa: physical punishment						
Yes	2,317	88.1	952	92.1	3,269	89.2
No	301	11.5	79	7.6	380	10.4
Don't know	11	0.4	3	0.3	14	0.4
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**
How teachers punish students - tq_7sb: shouting						

Question	Intervention		Control		Total	
	N	%	N	%	N	%
Yes	363	13.8	186	18.0	549	15.0
No	2,221	84.5	839	81.1	3,060	83.5
Don't know	45	1.7	9	0.9	54	1.5
Total	**2629**	**100.0**	**1034**	**100.0**	**3663**	**100**
How teachers punish students - tq_7sc: detention						
Yes	200	7.6	48	4.6	248	6.8
No	2,351	89.4	970	93.8	3,321	90.7
Don't know	78	3.0	16	1.6	94	2.6
Total	**2,629**	**100.0**	**1,034**	**100.0**	**3,663**	**100.0**
How teachers punish students - tq_7sd: other specify						
Yes	423	16.1	132	12.8	555	15.2
No	2,040	77.6	826	79.9	2,866	78.2
Don't know	166	6.3	76	7.4	242	6.6
Total	**78**	**3.0**	**16**	**1.6**	**94**	**2.6**

5.2.3 Interpretation and reflections

The measurement of IO2 is based on three indicators; percentage of teachers demonstrating effective use of ICT for whole class teaching; percentage of teachers demonstrating effective use of ICT for guiding personalized learning by students in the lab; and percentage of teachers that feel their teaching and learning practices have improved as a result of training and support. These indicators are assessed from the teacher's questionnaire. The indicators are measured through proportions and have been disaggregated by intervention group, gender and county. Improvements in the quality of teaching using ICT will be measured by comparing the proportions at midline/ endline with those at baseline (presented here) for control and intervention groups.

Table 5-16: Improved quality of teaching using ICT by primary school teachers[60]

Variables	Indicators		
	Indicator 1 (%)[61]	Indicator 2 (%)[62]	Indicator 3 (%)[63]
Overall (n=176)	86.4	86.4	85.8
Group			
Intervention (n=160)	91.9	92.5	92.5
A (n=44)	90.9	95.5	95.5
B (n=60)	88.3	90.0	90.0
C (n=56)	96.4	92.9	92.9
Control (n=14)	21.4	14.3	7.1
Gender			
Male (n=86)	88.4	88.4	88.4

[60] Teachers' questionnaire
[61] Indicator 1= Percentage of teachers demonstrating effective use of ICT for whole class teaching
[62] Indicator 2=Percentage of teachers demonstrating effective use of ICT for guiding personalized learning by students in the lab
[63] Indicator 3= Percentage of teachers that feel their teaching and learning practices have improved as a result of training and support

Variables	Indicators		
	Indicator 1 (%)[61]	Indicator 2 (%)[62]	Indicator 3 (%)[63]
Female (n=90)	84.4	84.4	83.3
County			
Kajiado (n= 21)	95.2	95.2	95.2
Kilifi (n= 61)	91.8	90.2	90.2
Makueni (n=34)	97.1	100.0	100.0
Uasin Gishu (n=60)	71.7	71.7	70.0

Effective use of ICT infrastructure by teachers for whole class teaching and/or personalised tutoring, and changes in teaching and learning behaviour inside the classroom are good measures on the learning process. The use of ICT infrastructure during instruction could be seen as effective use of teaching resources, whose effect in improving learning outcomes, such as numeracy and literacy scores, has been demonstrated in literature (Hattie, 2012). Similarly, best practices inside classrooms and/or labs during instruction is a prerequisite for a healthy interaction between teacher and learners and among learners. Healthy interactions create conducive environment for learning and this could lead to enhanced learning outcomes. It's therefore logical to argue that the indicators are good measures for IO2.

Despite the high values observed (in effective use of ICT, and classroom management practices) at baseline, there is still room for improvement. For instance, students felt that one in every five teachers sometimes encourage students during lesson interactions. Through iMlango, such a rating should be improved towards 'often encourage student'. Similarly, physical punishment, reported to be rampant in participating schools is another area for iMlango to work on with a view to reduce it. Physical punishment, can create physical harm to learners and/or discourage students from regular school attendance due to fear and/or stigma associated with punishment. Physical punishment could lead to poor transition and loss of interest in schooling – this could in turn translate to poor grades among affected learners. However, care should be taken not to create a vacuum, that is, if there are aspects of iMlango meant to reduce physical punishment, then a replacement to physical punishment should be put in place. The usual suspect as a replacement has always been guidance and cancelling and/or other forms that do not cause physical or psychological injury to learners.

5.3 IO 3: Learning progress by girls in primary schools

5.3.1 Selection of indicators, methodology for measuring them, and relevant project activities

Indicators:

1. Progress rate of girl students using Maths-Whizz Tutoring in the recommended way (i.e. more than 30 mins per week)
2. Percentage of girls with improved score in online literacy tests available through the portal
3. Percentage of girls with improved perception about the use of ICT for learning in their school

Tools and methodologies:
The inclusion of this intermediate outcome does not intend to duplicate the learning outcome, but rather to ensure that it is reflected in the ToC that learning progress is a fundamental aspect of iMlango.

Four indicators have been defined, two utilising the testing ability in mathematics and literacy through Math-Whizz and the portal. In Maths-Whizz the progress will be calculated through the central reporting system based on the girl's performance in the built-in assessments. For literacy, specific online quizzes will be used to assess girls' progression on the topic. This information has been collected by the project and provided to the EE.

Finally, the perceptions around ICT for learning have been examined through the Girls' School Survey undertaken for the evaluation cohort.

5.3.2 Findings

Indicator 1: Progress rate of girl students using Maths-Whizz Tutoring in the recommended way (project input)

Project's contribution

Maths-Whizz usage shows how much time students have spent learning on Maths-Whizz. It is typically presented as the average minutes per week over a given period. Students are recommended to use Maths-Whizz for 30-89 minutes each week to make the desired progress. Progress Rate is the expected change in a student's Maths Age over the course of a year; it is based on the increase in their Maths Age over a given period. For example, if your Maths Age increases by 0.2 years during one quarter of the year, your progress rate for that period is 4 quarters x 0.2 = 0.8. If your progress rate is 1.0, that means your Maths Age will increase by 12 months in a 12-month period.

By calculating the Maths Age of students in each Standard after their initial diagnostic Maths-Whizz assessment, we can model their expected annual growth in the absence of intervention. Specifically, Figure 5- shows the difference between iMlango students' Maths Ages and actual ages (their *Delta*) at the completion of their initial assessments in 2015. Students in standard 1 on average had a Maths Age of 2.9 years below their actual age. This difference gets larger as we move up the Standards, reaching a peak gap of 4.6 years below in Standard 6. Converting this change into a Progress Rate gives a baseline annual Progress Rate of 0.575. In other words, in each year of schooling, without intervention, Kenyan students make 0.575 years' progress, thus falling 0.425 additional years behind their international peers. In Standards 7 and 8 the difference begins to decrease. In-field observation suggests that this is likely caused by lower-attaining students dropping out of education. Moreover, those that remain are given additional attention as they approach the KCPE exams.

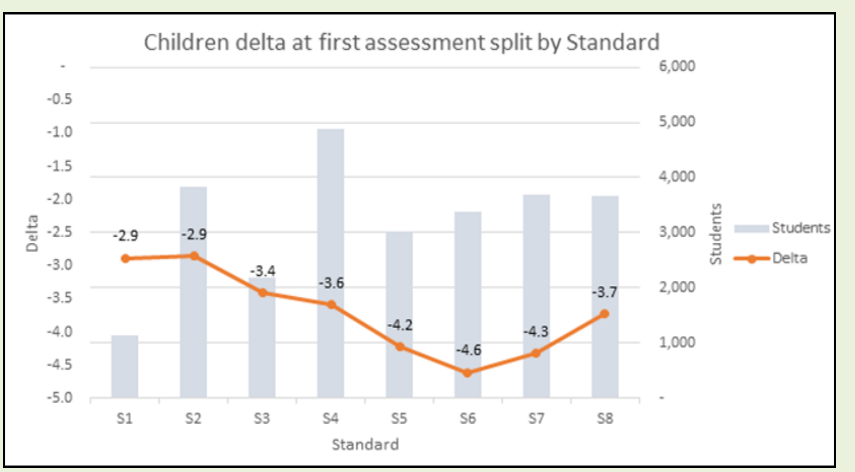


Figure 5-1: Average difference between actual age and Maths Age (Delta) after the Maths-Whizz initial assessment

By focusing on the progress rate of girls, we can gauge the learning outcomes they are going to achieve in relation to their Maths-Whizz usage. The goal is to achieve progress rates of more than 1.0, which means that students are experiencing accelerated learning at international standards - and can therefore recover the

lost ground displayed in the graph above. Sustaining a progress rate of 1.0 indicates that a student is progressing as expected for their age.

The table below presents the progress rates for the evaluation standards disaggregated by grade, gender and County for the students achieving 30 min or more of weekly usage. We should note here that this information is only available for Group A/C students as it is linked to individualised tutoring. The data presented refer to the average progress rate during Term 1 2018 which we will use as the baseline figure.

Table 5-17: Maths-Whizz progress rate for evaluation standards[64]

County	Grade 2		Grade 6		Grade 7		Total	
	Female	Male	Female	Male	Female	Male	Female	Male
Kajiado	0.31	0.21	1.43	1.13	1.14	1.43	1.27	1.22
Kilifi	0.83	1.17	1.27	1.32	1.10	1.38	1.17	1.33
Makueni	1.29	0.00	0.77	0.75	0.79	0.67	0.83	0.75
Uasin Gishu	0.73	0.64	1.13	1.10	0.87	1.13	0.95	1.00
Total	**0.78**	**0.92**	**1.27**	**1.13**	**1.00**	**1.22**	**1.10**	**1.14**

Because we have provided the disaggregation per Standard and County in the table above, the sample size of each subgroup is relatively small. Nevertheless, looking at the total average progress rates achieved, we can see that for females (1.10) and males (1.14) using the Maths-Whizz Tutor for 30 - 89 mins, learning is progressing at a rate higher than 1.0, which denotes higher than expected learning at international standards. By Grade and by County, most groups' learning overall is progressing at a rate higher than 1.0, and all are progressing at higher than the Kenyan baseline annual progress rate of 0.575 mentioned above. (NB. This indicator shows how students are performing on the Maths-Whizz Tutor when they use it at the recommended rate, and therefore illustrates how recommended usage relates to learning outcomes. This indicator links directly with the indicator "% of students achieving 30 - 89 mins of weekly usage". These two indicators viewed together will show relative progress or improvement since baseline)"
At this point we would like to note a caveat: this indicator will not demonstrate impact at scale.. It shows how students are performing on the Maths-Whizz Tutor *when* they use at the recommended rate or higher, and therefore illustrates how usage relates to learning outcomes. This indicator relates directly to the % of students achieving 30 or more mins of weekly usage[65].. Throughout term 1 of 2018, 5.7% of students in these grades achieved 30 or mins average weekly usage on the Maths-Whizz Tutor. These two indicators together will show relative progress or improvement since baseline.

[64] Numbers in parentheses () denote number of students. The table includes students using at recommended (i.e. 30 - 89 minutes/wk)
[65] Throughout term 1 of 2018, 5.7% of students in these grades achieved 30 or mins average weekly usage on the Maths-Whizz Tutor.

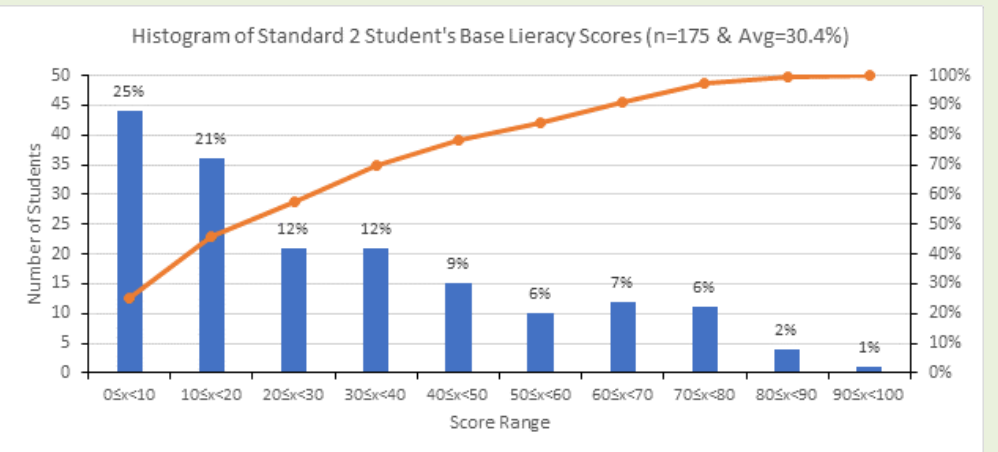
Indicator 2: Percentage of girls with improved score in online literacy tests available through the portal (project input)

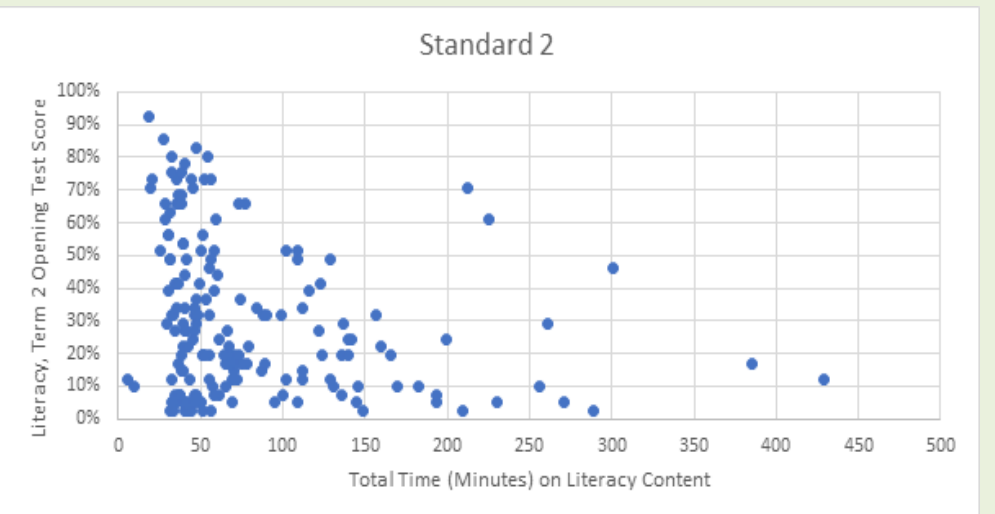
Project's contribution

As part of the Longhorn content that is made available through the iMlango portal (see Annex 15 for more information on the portal), the students have access to literacy quizzes to be able to assess the progress throughout the terms of the school year. These tests are multiple choice and the students can complete them individually in the lab through their account.

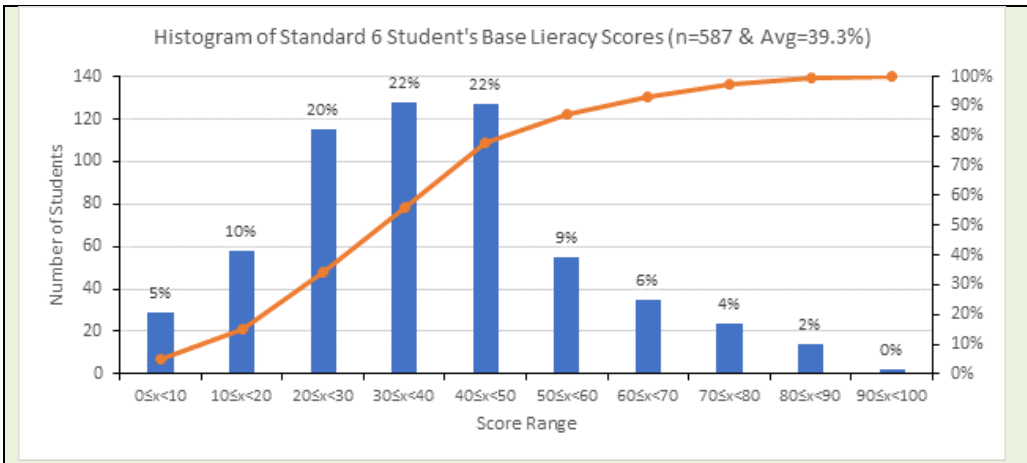
In order to get more information on girls' progress in literacy we will be testing the evaluation standards termly using these Longhorn quizzes and capture the results with this indicator. The results for Term 2 2018 are presented in the charts that follow in this subsection disaggregated by standard.

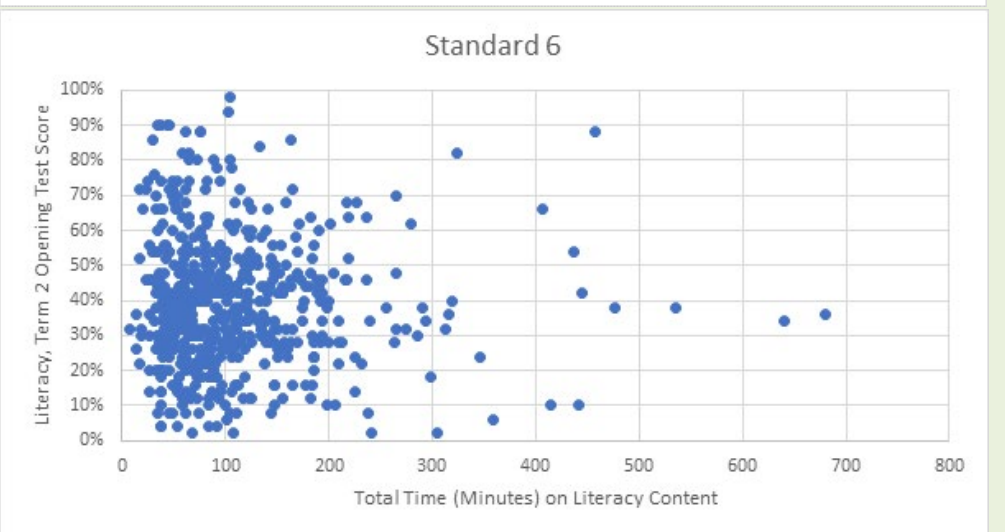
Standard 2
#: 175
Avg Score: 30.4%



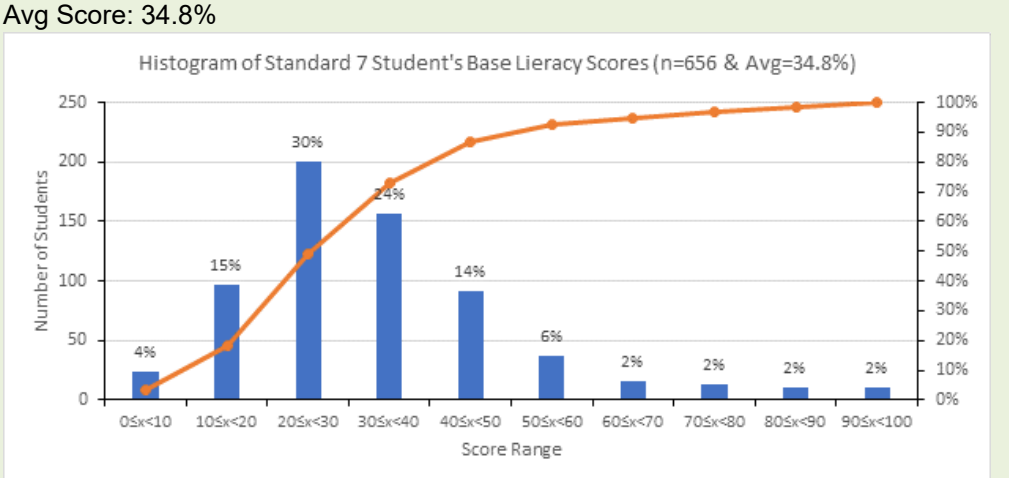


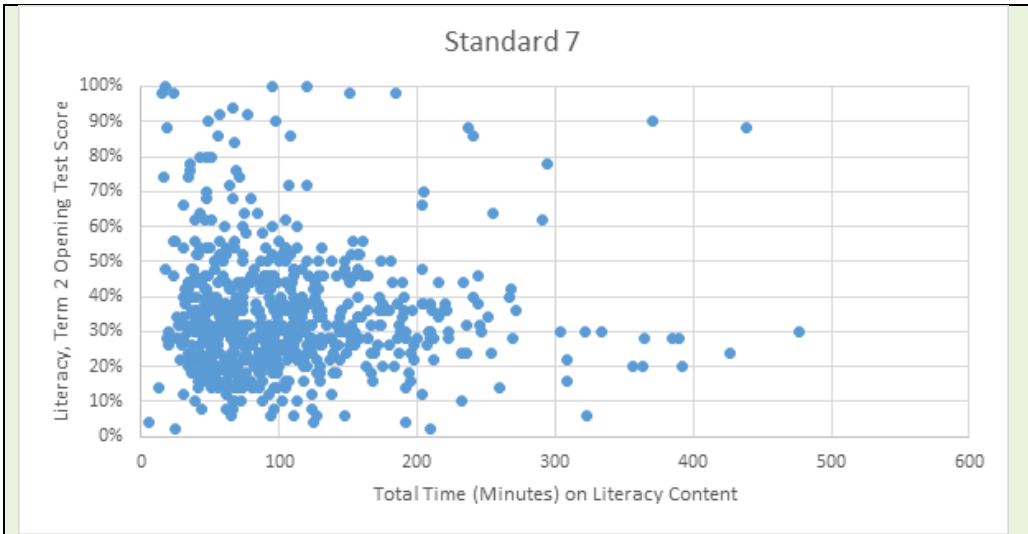
Standard 6
#: 507
Avg Score: 39.3%





Standard 7
#: 656
Avg Score: 34.8%





We need to note here that we will need to assess the usefulness of the results of the quizzes at a later stage in the project and adjust this indicator as needed.

Indicator 3: Percentage of girls with improved perception about the use of ICT for learning in their school

Table 5-16 show results for girls' perception on the use of ICT for learning as well as accessibility to ICT infrastructure. About seven in every ten girls (71.3%) in the treatment school have access to computers in school. Furthermore, nearly all the girls (71.3%) who have access to computer at school use it at least once a week. This high level of computer usage among the girls in school would be a result of project activities. The Maths-Whizz data presented indicates that students achieving 30 - 89 minutes of weekly usage will achieve a higher than expected rate of mathematics learning (at international standards) (Section 5.3.2). Perhaps this high level of computer usage would also impact positively resulting on accelerated learning in literacy.

Classes with computer were more preferred by girls as they considered them interesting and provided opportunities for learning and access to information. They also perceived the materials that are available for learning to be relevant for their school progress (with about 68.8% of girls in treatment schools agreeing or strongly agreeing). For them to get more benefits from the computers, they felt the need to spend more time in classroom computer lessons. Further qualitative research investigating the reasons why girls prefer the ICT classes are to be done at the Midline evaluation point. Among the girls in the intervention group who said that they have no access to computer at school, about 5.4% said it was because the school did not allow them to use computers. Further analyses, revealed that those reporting that schools do not allow them to use computers were distributed about equally across the grades – implying this reporting was not only common among girls in the lower grades where computers usage might be expected to be low since the girls are too young. These is strange as one would have expected all intervention schools would allow students to use computers. In terms of counties, levels of computer usage were lowest in Makueni (45.5%) and highest in Kajiado (67.2%). However, it was not clear why these levels varied across the countries.

Table 5-18: Girls' perception about the use of ICT for learning

			Age (intervention + control)			County (intervention + control)			
Variable	**Intervention (%) n= 2,866**	**Control (%) n=1,098**	**<10 (%) n= 983**	**10-15 (%) n=2,694**	**<15 (%) n= 287**	**Kajiado (%) n= 442**	**Kilifi (%) n= 1,402**	**Makueni (%) n=1,041**	**Uasin Gishu (%) n= 1,079**
Personally gets an opportunity to use computers? ICT_1									
Yes	72.1	18.3	60	56.8	51.6	67.2	59.7	45.5	61.1
No	19.6	75.9	33.5	35.4	38.6	27.4	30.2	49.5	31.1
No data	8.3	5.8	6.5	7.8	9.8	5.4	10.1	5	7.8
Where do you use the computers? ICT_2									
School	71.3	14.1	58.9	54.7	50.9	63.8	59.1	43.3	58.9
At my home	0.5	1.8	0.5	1.0	0.4	2.0	0.3	1.2	0.8
Other (cyber, friend's place)	0.3	2.4	0.6	1.0	0.4	1.4	0.3	1.1	1.3
No data	27.9	81.7	40.0	43.2	48.4	32.8	40.3	54.5	38.9
How many times in a week do you use the computers? ICT_3									
Once a week	24.7	11.4	28.2	18.5	20.6	34.8	21.3	10.7	25.0
2 to 3 times a week	40.4	6.4	27.9	32.7	25.1	29.2	31.8	31.6	30.0
>3 times a week	6.9	0.6	4.0	5.5	5.9	3.2	6.6	3.3	6.0
No data	27.9	81.7	40.0	43.2	48.4	32.8	40.3	54.5	38.9
What are the reasons why you do not have access to the computers? ICT_4									
Don't know how to use	3.5	13.5	5.5	6.2	9.4	4.8	6.8	6.8	5.8
School doesn't allow	5.4	14.3	7.8	7.9	8.0	11.5	8.1	11.3	2.9
Not interested	0.5	0.2	0.5	0.3	1.7	0.9	0.7	0.1	0.2
Other	10.1	47.9	19.6	21.1	19.5	10.2	14.6	31.2	22.3
No data	80.4	24.1	66.5	64.6	61.3	72.6	69.8	50.5	68.9

Think that access to computer/ internet is necessary for education ICT_5									
Yes	86.5	82.1	83.6	86.5	79.4	84.6	83.9	90.5	82.2
No	1.9	4.1	2.9	2.1	4.5	4.1	2.4	2.7	1.8
Don't know	3.4	8.0	7.0	3.7	6.3	5.9	3.7	1.8	8.3
No data	8.3	5.8	6.5	7.8	9.8	5.4	10.1	5.0	7.8
How can you benefit from using computers? ICT_6									
Access to learning	63.5	53.9	67.5	58.7	58.2	55.2	60.1	65.2	59.9
Access to information	18.5	20.1	10.4	22.2	17.4	19.2	19.8	17.7	19.0
Other	4.5	8.0	5.8	5.5	3.8	10.2	4.0	7.6	3.3
No data	13.5	17.9	16.4	13.6	20.6	15.4	16.1	9.5	17.8
Why do you think that you do not benefit from using computers? ICT_7									
Not interested	0.3	0.6	0.2	0.3	1.4	0.5	0.4	0.2	0.4
Don't understand how computers work	1.1	2.3	1.3	1.3	2.4	2.7	1.4	1.3	0.9
Other	0.5	1.3	1.3	0.5	0.7	0.9	0.5	1.3	0.5
No data	98.2	95.9	97.2	97.9	95.5	95.9	97.7	97.3	98.2
Prefer the classes where the teacher use computer/ internet ICT_8									
Yes	65.3	15.8	54.4	51.0	47.0	57.2	53.7	42.6	55.1
No	5.3	1.1	3.3	4.5	3.8	7.5	4.4	2.1	4.3
Not sure	27.9	81.7	40.0	43.2	48.4	32.8	40.3	54.5	38.9
No data	1.5	1.5	2.3	1.3	0.7	2.5	1.6	0.9	1.7
Why do you prefer such a classes? ICT_9									
More interesting	27.1	6.4	28.3	19.0	19.2	16.5	22.9	17.5	25.0
I pay attention	5.5	0.8	4.9	3.9	4.5	4.1	4.5	3.0	5.1
I learn more during class	21.3	5.7	13.8	18.4	15.0	24.7	18.6	13.5	15.1

I remember materials better	8.1	1.9	4.7	7.0	5.9	7.2	5.9	5.1	7.9
Other	3.3	0.9	2.8	2.6	2.4	4.8	1.9	3.5	2.0
No data	34.7	84.2	45.6	49.0	53.0	42.8	46.3	57.4	44.9
The materials in the computer used in our lessons are relevant to our learning needs. ICT_10									
Strongly agree	42.3	6.3	28.5	34.1	29.3	41.6	36.3	21.3	34.0
Agree	26.5	8.3	26.7	19.7	19.9	22.0	20.2	19.9	24.4
Neither agree nor disagree	2.4	3.1	3.7	2.3	2.1	3.4	2.4	3.7	1.7
Disagree	0.6	0.6	0.9	0.5	0.4	0.2	0.5	0.6	0.9
Strongly disagree	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
No data	28.1	81.8	40.2	43.4	48.4	32.8	40.7	54.5	38.9
How would you benefit more from the lessons taught using computers? ICT_11									
Spend more time on computer lessons	41.0	43.3	45.9	39.6	38.5	37.4	42.3	43.0	40.1
Have more interaction with teachers	17.8	14.9	19.2	16.6	20.3	16.8	17.8	11.8	21.6
Access to more materials	34.2	30.4	26.8	36.6	34.5	28.3	34.1	36.5	34.3
Other specify	6.6	10.0	7.5	6.7	6.8	17.5	4.9	7.8	4.1
No data	0.44	1.49	0.68	0.52	0	0	0.96	0.84	0

Note: These data were from the GSS tool

The measurement of IO3 is based on three indicators: Percentage of girls who think that access to computer/ internet is necessary for education; percentage of girls who prefer the classes where the teacher use computer/ internet; and percentage of girls who perceive materials in the computer used in lessons to be relevant to their learning needs. These indicators are obtained from the girls' survey. The indicators are measured through proportions and have been disaggregated by intervention group and county. Improvements in perceptions about the use of ICT for learning in school will be measured by comparing the proportions at midline/ endline with those at baseline (presented here) for control and intervention groups.

Table 5-19: Percentage of girls with improved perception about the use of ICT for learning in their schools

Variables	Indicators		
	Indicator 1 (%)	Indicator 2 (%)	Indicator 3 (%)
Overall (n=3964)	85.2	51.6	53.8
Group			
Intervention (n= 2866)	86.5	65.3	68.8
A (n= 777)	91.4	83.8	87.9
B (n=1121)	77.4	37.4	39.2
C (n=968)	93.0	82.8	87.8
Control (n=1098)	82.1	15.8	14.6
County			
Kajiado (n= 442)	84.6	57.2	63.6
Kilifi (n=1402)	83.9	53.7	56.5
Makueni (n=1041)	90.5	42.6	41.2
Uasin Gishu (n=1079)	82.2	55.1	58.4

Notes:
Indicator 1-Think that access to computer/ internet is necessary for education (ICT_5);
Indicator 2 - Prefer the classes where the teacher use computer/ internet (ICT_8);
Indicator 3 - Perceive materials in the computer used in lessons to be relevant to their learning needs (ICT_10)
Source: Girls survey (GSS)

5.3.3 Interpretation and reflections

Many studies measure perceptions using a battery of questionnaire items, as was done in the case of the girls' perception on ICT in this evaluation (Scherer et al., 2016[66]; Blazar, 2015[67]; Chung et al., 2015[68]). Such an approach, where rating scores and/or proportions of individuals who have a certain inclination to an issue or object are computed.

[66] Scherer, R., Nilsen, T., & Jansen, M. (2016). Evaluating Individual Students' Perceptions of Instructional Quality: An Investigation of their Factor Structure, Measurement Invariance, and Relations to Educational Outcome. *Frontiers in Psychology: Quantitative Measurements in Psychology*, https://www.frontiersin.org/articles/10.3389/fpsyg.2016.00110/full
[67] Blazar, D. (2015). Effective teaching in elementary mathematics: identifying classroom practices that support student achievement. *Econ. Educ. Rev.* 48, 16–29. doi: 10.1016/j.econedurev.2015.05.005
[68] Chung, C., Liao, X., Song, H., and Lee, T. (2015). Bifactor approach to modeling multi-dimensionality of physical self-perception profile. *Measurem. Phys. Educat. Exercise Sci.* 20, 1–15. doi: 10.1080/1091367X.2015.1081594

The results presented in Table 5-18 show creation of interest in the use of computers for learning by the girls. There is also a heightened preference for lessons that integrate ICT in teaching. The positive attitude towards ICT provides learning opportunities for girls as well as a potential challenge to teachers. Opportunities created will be informed of access to learning materials and self-assessment that could ultimately translate to better learning outcomes. The fact that ICT and computers are 'liked' by girls could be a source of interest in schooling, which could ultimately translate to better transition. The interest could also translate to higher levels of Maths-Whizz and portal usage by the girls resulting in accelerated learning, and thus improved transition. Regarding the challenge posed by ICT to teachers, timely updating of computers with learning materials, and monitoring girls' use of computers for learning requires an efficient and effective school system so that gains already made are sustained. Project plans to review this in more details at Midline point.

5.4 IO 4: Improved life skills for girls

5.4.1 Selection of indicators, methodology for measuring them, and relevant project activities

Indicators:

1. Percentage of girls' club members reporting engaging in targeted behaviours in girls' survey questionnaire.
2. Percentage of girls' club members able to identify ways in which the acquired skills can help them achieve their goals
3. Percentage of girls visiting Community Internet Hubs (CIHs) with improved targeted behaviours / skills (not relevant for baseline as activity has not started yet)

Tools and methodologies:

As part of research package conducted by the EE, a student survey will be undertaken at midline including questions on whether girls have participated in clubs – an ex-post survey at Midline and Endline will be implemented to test progress in targeted behaviours. These behaviours will be finalised in consultation with DLA and the EE after the baseline. Below is a sample of the questions that the survey is likely to address:

- How long have you been part of the girls' club?
- How often do you meet?
- What are your favourite parts of the club?
- Have you engaged in the MBW curriculum? If so, what parts?
- Have you engaged with the income generation toolkit? If so, what parts?
- Do you feel safe as part of the clubs. (Very, somewhat, not at all)
- How free are you to set the direction of your own life? (Very, somewhat, not at all)
- How free are you to express yourself to peers? (Very, somewhat, not at all)
- How free are you to express yourself to teachers or parents? (Very, somewhat, not at all)
- How able are you to deal with threats obstacles, and set-backs? (Very, somewhat, not at all)
- How able are you to make things happen in your environment? (Very, somewhat, not at all)
- I am considered a leader in my peer group. (Very, somewhat, not at all)
- Have you learned a new skill or talent as part of the club? (Please list)
- Have you been able to raise money or other items of value as part of club activities?
- If any funds have been raised, what has your group used them for?

In addition, specific focus groups will be held with those attending clubs to gather information on the impact of the intervention. The avenues of inquiry are likely to follow the above survey questions but also focus on the quality of girls clubs and whether they have produced a safe space for girls.

Following the same principle as in indicator 1, research will be undertaken with participants of the CIHs through the use of girl surveys to understand how well the CIHs are contributing to the targeted behaviours. As the design of the CIHs has not been finalised yet, we will need to revisit and refine this indicator after the CIH pilot.

5.4.2 Findings

The girl club activities have been delayed so there will be meaningful tracking of their indicators at midline, however we are presenting below findings around girls' life skills and self-esteem as evaluated from the GSS. These findings will be used to inform the specific design and focus of both the girl clubs and the out-of–school (OOS) girl activities from the project.

(a) Life skills

In terms of life skills for those above 12-years old, results show that the differences between the girls in the intervention and control groups were not much - indicating existence of baseline balance (Table 5-20). Nevertheless, girls in the intervention group felt they were more confident when answering questions in class.

Girls were scored on each item with a scale of 1-5, with a "1" and a "5" being awarded to responses of "strongly disagree" and "strongly agree" on positive statement, respectively. Reversed scoring was applied on negative statements. Thus, the results in Table 5-20 show that, in general, most girls above 12-years old tended to agree or strongly agree with the positive statements, and disagree or strongly disagree with the negative - meaning that they scored highly on the life skill items. For instance, an overall mean of 4.7 on the second item is interpreted to imply that a vast majority of the girls tended strongly agree that they wanted to do well in school.

(b) Self-esteem

iMlango project's perceived effects on the girls' self-esteem, decision making, problem solving: Results from analysing FGD with girls and boys show that there has been an appreciable difference in self-esteem and positivity on future prospects by the girls as shown by the responses below:

One of the contributory factors to the self-esteem are the debates as indicated by a girl participating in FGD in Kilifi.

"It has made many pupils to have self-esteem because of the debates" (FGD Girls Kilifi)

According to another girl in Makueni, they (the girls) are now more confident and are able to stand and talk before other pupils, insinuating that they could not do that before iMlango

"We are now able to stand and talk before our fellow pupils. It can stimulate growth of ideas" (FGD Girls Nunguni).

The perception of increased confidence by the girls was corroborated by one CEO from Malindi who said,

''*Yeah because once they are given an opportunity to demonstrate or use the computers I think to the girls they build their confidence and later we realize that the girls can now be given some responsibilities and do them as much as the boys, yeah''.*

(c) Future Prospects

The perception of brighter futures by both girls and boys was expressed in the FGD. One boy (FGD boys, Makueni) said that his dream is to be an engineer as a result of the exposure in ICT. He said that using a

computer in primary school can help pupils like him to do a course in computer and science. One girl (FGD Kilifi) said her life will be bright because of the support she is receiving in iMlango,

"Yes it will be bright because, the kind of support I am getting from iMlango, it helps me gain confidence and become somebody, just like the others" (FGD girls Rabai).

One boy (FGD Kajiado) expressed positive future prospects because he now has the capacity to teach himself beyond what the teacher covers in class using the computers.

"My life will be very good because if there is something the teacher has not taught us in class I can go get the computer and teach myself" (FGD Boys Athi River Prisons).

Apart from the boys and girls, others also expressed an expectation for a brighter future for the children. Two young mothers (FGD Kilifi, FGD Uasin Gishu) said that the importance of educating a girl-child is to prevent early marriage, misbehaviour and preparing a good future for her. If the girl is successful, she will also help the parents.

(d) Improved performance in math by girls

Participants in FGD BOM (Uasin Gishu), FGD girls (Kilifi, Kajiado, Makueni and Uasin Gishu), FGD young mothers (Kilifi), FGD Teachers (Makueni), FGD Older fathers (Kilifi) spoke of observing improved performances in maths by the girls. A girl in Kajiado felt that indeed girls have a better attitude and are performing better in math than boys:

"Okay. Right now, maybe I have …. I know am doing better with math. And you know most of the boys just say "if this thing is not adding up, am not doing it." You see, they don't have self-confidence. Is just …even when you go there to the lab, they are just seated at the back, just there and most of the girls are very attentive…okay I won't say all the boys, most of the boys. And I think girls are now performing well in mathematics" (FGD Girls, Oloolua, Kajiado).

Another girl spoke of how the maths whiz is helping the girls to improve,

"We gaining a lot from Maths Whizz because when you go the lab and you know math, and your friends have done it, you can call all your friend and discuss until you get the answer" (FGD Girls, Kilifi).

A teacher in Makueni said that Maths-Whizz has increased the students' capacity to solve maths problems:

"When it comes to Maths, the pupils who never liked Mathematics now are able to solve questions in Mathematics, they are enjoying the subject and they are ready to work. Because now they have come to like Maths and English because of the Maths-Whizz and literature that they get by reading story books in the computers" (FGD Teachers, Makueni).

Table 5-20: Perceptions on life skills for girls aged 12 years and above

Life Skill Tested	Mean score on life skills (1 - 5)			
	Intervention	Control	P-value	Total
I am able to do things as well as my friends	4.4	4.4	0.484	4.4
I want to do well in school	4.7	4.7	0.222	4.7
I get nervous when I have to read in front of others	3.7	3.6	0.364	3.6
I get nervous when I have to do maths in front of others	3.7	3.7	0.606	3.7
I feel confident answering questions in class	4.3	4.1	0.006	4.2

I can stay focused on a goal despite things getting in the way	4.3	4.3	0.792	4.3
I would like to continue studying/ attending school after this year	4.7	4.6	0.094	4.6
I can put a plan in place and stick with it	4.3	4.3	0.451	4.3
I recognise when choices I make today about my studies can affect my life in the future.	4.3	4.2	0.179	4.3
I can describe my thoughts to others when I speak	4.2	4.1	0.188	4.2
If someone does not understand me I try to find a different way of saying what is on my mind	4.3	4.3	0.680	4.3
When others talk I pay attention to their body language, gestures and facial expressions	4.1	4.1	0.092	4.1
I can work well in a group with other people	4.4	4.4	0.596	4.4
When I have the opportunity, I can organize my peers or friends to do an activity.	4.3	4.3	0.967	4.3
I often feel lonely at school	3.8	3.8	0.837	3.8
I ask the teacher if I don't understand something	4.4	4.3	0.093	4.4
When I succeed at school it is because I worked hard	4.6	4.5	0.132	4.6
If I do well in a test it is because I am lucky	3.8	3.7	0.061	3.7
Overall mean score on life skills (1 - 5)	**4.24**	**4.19**	**0.045**	**4.22**

(e) Decision making among girls aged 12 years or above

In regards to decision making, when the intervention and control data are considered together, results show that about one-half of the girls interviewed (who were aged 12 years or above) reported that they made decision on whether or not to go to school (46.8%), whether or not to continue with schooling (48.7%), and when or at what age to get married (52.8%). On the other hand, around three in every four girls who were interviewed reported that they are responsible of making decisions on whether or not they would work after finishing their studies (73.1%), what type of work they would do after finishing their studies (77.5%), how they spend their free time (75.1%), and how often they spend time with friends (72.8%).

In addition, results in Table 5-21 show that, in general, the percentages of girls in each decision category did not differ much when the data were split by study group, indicating existence of baseline balance. For example, in regard to who made the decision on whether the girl goes to school, the percentage of girls making this decision by themselves was around 47% for both intervention and control group; the corresponding percentage for girls jointly make this decision with their families was around 16% for both groups; while the corresponding percentages for families making this decision for the girls was around 37%. Nevertheless, there was some small balance imbalance in some categories of some variables - meaning that such imbalances will need to be taken into account when assessing the impact of the intervention at midline and endline.

Table 5-21: Decision making among girls aged 12 years and above

Response	Intervention		Control		Total	
	N	%	N	%	N	%
Whether or not girl goes to school						
Girl decides	787	46.7	290	47.0	1,077	46.8
jointly decide with family	272	16.1	99	16.1	371	16.1
Family decides	627	37.2	228	37.0	855	37.1
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**
Whether or not girl continues in school past current year						

Response	Intervention		Control		Total	
	N	%	N	%	N	%
Girl decides	821	48.7	300	48.6	1,121	48.7
jointly decide with family	268	15.9	83	13.5	351	15.2
Family decides	597	35.4	234	37.9	831	36.1
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**
When/ at what age girl will get married						
Girl decides	884	52.4	332	53.8	1,216	52.8
jointly decide with family	236	14.0	69	11.2	305	13.2
Family decides	566	33.6	216	35.0	782	34.0
Total	**1686**	**100.0**	**617**	**100.0**	**2303**	**100.0**
If girl will work after finishing studies						
Girl decides	1,231	73.0	453	73.4	1,684	73.1
jointly decide with family	152	9.0	48	7.8	200	8.7
Family decides	303	18.0	116	18.8	419	18.2
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**
What type of work girl will do after she finishes studies						
Girl decides	1,314	77.9	471	76.3	1,785	77.5
jointly decide with family	136	8.1	50	8.1	186	8.1
Family decides	236	14.0	96	15.6	332	14.4
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**
How girl spends her free time						
Girl decides	1,239	73.5	490	79.4	1,729	75.1
jointly decide with family	140	8.3	31	5.0	171	7.4
Family decides	307	18.2	96	15.6	403	17.5
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**
How often girl spends time with her friends						
Girl decides	1,200	71.2	476	77.2	1,676	72.8
jointly decide with family	168	10.0	36	5.8	204	8.9
Family decides	318	18.9	105	17.0	423	18.4
Total	**1,686**	**100.0**	**617**	**100.0**	**2,303**	**100.0**

(f) Life skills among girls aged below 12 years

For below 12-year old girls, results show existence of baseline balance in terms of life skill in general (see Table 5-22). Nevertheless, the tendency of asking questions to teachers was higher among girls in the intervention group than among girls in the control group.

Table 5-22: Life skills among girls below 12 years

Life Skill Tested	Mean score on life skills (1 - 5)			
	Intervention	Control	P-value	Total
I am able to do things as well as my friends	4.3	4.3	0.477	4.3
I want to do well in school	4.6	4.5	0.639	4.6
I get nervous when I have to read in front of others	3.6	3.6	0.734	3.6

I get nervous when I have to do maths in front of others	3.7	3.6	0.346	3.7
I feel confident answering questions in class	4.1	4.0	0.906	4.1
I would like to continue studying/ attending school after this year	4.5	4.5	0.858	4.5
I can describe my thoughts to others when I speak	4.0	4.0	0.223	4.0
I can work well in a group with other people	4.2	4.2	0.276	4.2
When I have the opportunity, I can organize my peers or friends to do an activity.	4.1	4.1	0.812	4.1
I ask the teacher if I don't understand something	4.2	4.0	0.002	4.2
When I succeed at school it is because I worked hard	4.4	4.4	0.665	4.4
If I do well in a test it is because I am lucky	3.3	3.3	0.767	3.3
Overall mean score on life skills (1 - 5)	**4.1**	**4.0**	**0.229**	**4.1**

(g) Decision making among girls below 12-years old

When the intervention and control data are considered together for girls below 12 years old, about one-half of the girls reported that their families made key schooling decisions for them (i.e. whether to go to school or not, 50.5%; and whether or not to continue with schooling beyond current grade, 51.3%) - and this was expected given their young age. Likewise, about one-half of the girls in this age category reported that their families would make decision on when or what age they would get married (54.9%). Importantly, like what was observed with the 12-years and above old girls, there was existence of baseline balance in most categories of these decisions when the data were split by study groups (intervention versus control).

Table 5-23: Decision making among girls below 12 years

Response	Intervention		Control		Total	
	N	%	N	%	N	%
Whether or not girl goes to school						
I decide	437	34.6	120	28.8	557	33.1
jointly decide with family	211	16.7	65	15.6	276	16.4
Family decides	617	48.8	232	55.6	849	50.5
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**
Whether or not girl continues in school past current year						
I decide	458	36.2	114	27.3	572	34
jointly decide with family	188	14.9	60	14.4	248	14.7
Family decides	619	48.9	243	58.3	862	51.3
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**
When/ at what age the girl will get married						
I decide	390	30.8	115	27.6	505	30
jointly decide with family	191	15.1	63	15.1	254	15.1
Family decides	684	54.1	239	57.3	923	54.9
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**
If the girl will work after you finish your studies						
I decide	628	49.6	169	40.5	797	47.4
jointly decide with family	141	11.2	45	10.8	186	11.1
Family decides	496	39.2	203	48.7	699	41.6
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**

Response	Intervention		Control		Total	
	N	%	N	%	N	%
What type of work girl will do after finishing her studies						
I decide	678	53.6	205	49.2	883	52.5
jointly decide with family	124	9.8	39	9.4	163	9.7
Family decides	463	36.6	173	41.5	636	37.8
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**
How often girl spends time with her friends						
I decide	621	49.1	180	43.2	801	47.6
jointly decide	169	13.4	61	14.6	230	13.7
Family decides	475	37.6	176	42.2	651	38.7
Total	**1,265**	**100**	**417**	**100**	**1,682**	**100**

5.4.3 Interpretation and reflections

The girl club activities were not measured at baseline since they are yet to begin. However, since such club activities enhance girls' life skills and self-esteem we shall interpret and reflect on the findings of these two aspects – bearing in mind that the later could be a subset of the former. The effect of girls' clubs have been described through the results of a study done by the GAGE programme in which rigorous analysis of 44 different community and school-based girls' clubs were conducted with a gender equality focus. The Girls' Clubs analysed by the GAGE programme were deemed similar to the iMlango ones as they are both in-school and community-based-as are iMlango. They also include a gender lens as do the iMlango ones. The results of the GAGE Programme analyses resultsshowed the benefits of girls' clubs to include: Attitudes to gender equality and discriminatory practices; Self-esteem and self-confidence; Knowledge and education; and civic and community action (Marcus, 2017)[69]. Life-skills, also referred to as soft-skills in some quarters, lack a standardized conceptualization and instrumentation hence it is not easy to make comparisons of intervention impacts or validate best practices (Duerden et al., 2012)[70]. That said, among the common life skills measured in literature include communication, critical thinking, leadership, problem solving, self-esteem, among others (Kennedy et al., 2012[71]; Nasheeda et al., 2018[72]). During iMlango baseline, data on life skills was collected by asking statements requiring the respondents to provide a perspective, opinion or feeling towards a construct mentioned in the statement. The responses were binary (e.g. yes/no) or likert-type scale. The iMlango assessment of girls' life skills followed what is available in literature in measuring life skills. The EE finds this to be sufficient in measuring life skills.

From the results presented in this section, the iMlango project could be benefiting girls with life skills as demonstrated from both quantitative and qualitative results presented. However, at baseline, we do not find strong differences between intervention and control groups in terms of girls' responses on life skills. This

[69]https://www.gage.odi.org/sites/default/files/2017-11/GAGE%20Girls%20Club%20Policy%20Brief%20-%20WEB.pdf

[70] Duerden, M.D., Witt , P.A., Fernandez , M., Bryant , M.J., Theriault , D. (2012). Measuring Life Skills: Standardizing the Assessment of Youth Development Indicators. *Journal of Youth Development*, 7(1). Available from: https://www.researchgate.net/publication/263809847_Measuring_Life_Skills_Standardizing_the_Assessment_of_Youth_Development_Indicators [accessed Sep 06 2018].

[71] Kennedy, F., Pearson, D., Brett-Taylor, L., & Talreja, V. (2014). The life skills assessment scale: Measuring life skills of disadvantaged children in the developing world. Social Behavior and Personality, 42(2),pp. 197-210.

[72] Nasheeda, A., Abdullah, H.B., Krauss, S.E., & Ahmed, N.B. (2018). A narrative systematic review of life skills education: effectiveness, research gaps and priorities. International Journal of Adolescence and Youth, DOI: 10.1080/02673843.2018.1479278

would therefore mean that at midline and/or endline, we expect to observe strong differences on life skills should the project be effective in promoting such skills among girls. Overall, and as would be expected, older girls compared to the younger girls were more likely to make decisions in question. The data also show that among the older and younger girls, about half and one-third, felt they make the decisions in question, respectively. The two decision-areas where most girls felt they were in control of making the decisions were in the use of their free time and transitions to work after completing their schooling. Other than these two areas (use of free time and transitions to the labour market), the project could provide life skills targeted at improving decision making among girls in the other areas mentioned in Tables 5-18 and 5-20.

5.5 IO 5: Increased use of iMlango reports by key stakeholders

5.5.1 Selection of indicators, methodology for measuring them, and relevant project activities

Indicators:

1. Percentage of local Ministry of Education officials using the attendance and learning reports to drive decision making and support actions in the schools (quantitative)
2. Percentage of local Ministry of Education County officials who perceive the decision making process to be improved as a result of the iMlango reports (qualitative)
3. Percentage of headteachers using the attendance and learning reports to drive decision making and support actions in the schools (quantitative)
4. Percentage of headteachers with improved perception on improvements in decision making processes as informed by iMlango reports made (qualitative)

Tools and methodologies:

Exploring the broad range of decisions and actions taken by local Ministry of Education officials and school headteachers will require a mixed methods approach to be undertaken by the EE. Questionnaires for indicators 1 and 3 will be carried out with officials and headteachers to report what key decisions data reporting supported them in making. These key decisions will be probed by the EE during the baseline to further inform the indicator wording for the subsequent evaluation points.

Qualitative focus group discussions will be undertaken with a select cohort of beneficiaries for indicator 2 and 4 to investigate further into the specifics of how iMlango reports are impacting actions made from decisions specifically informed by reports.

5.5.2 Findings

Indicator 1: Percentage of local Ministry of Education officials using the attendance and learning reports to drive decision making and support actions in the schools (quantitative)

By design, data collected from Ministry of Education officials was qualitative.

The County MOE officials interviewed said that they have themselves embraced ICT and use it in their day-to-day work. They spoke of several ways in which the reports inform their decisions with regard to iMlango schools. These include: during Board meetings (Kajiado), monitoring the use of ICT in schools (Kilifi), meetings with teachers (Kilifi), conducting trainings on ICT for Teachers (Makueni, Uasin Gishu), making use of the government policy of ICT into learning to enforce it (Makueni). One decision that has been made is allowing change of timetable to accommodate computer lessons (FGD BOM (Uasin Gishu). The officials did not speak of any change to existing education policy as a result of their learnings from iMlango but spoke of their appreciation for iMlango project as in sync with the government ICT-integration policy and

National Education Policy Project where ICT exist as one of pillars. Despite the activities mentioned above, only 3 MOE officials (Kilfi, Uasin Gishu and Kajiado) said they have an action plan to promote ICT use in their areas of jurisdiction.

Indicator 2: Percentage of local Ministry of Education County officials who perceive the decision making process to be improved as a result of the iMlango reports (qualitative)

By design, data collected from Ministry of Education officials was qualitative.

Out of the 8 MOE officials, 5 had perceptions that iMlango has helped to improve decision-making. Two (2) of them cited using the internet at the schools for their work, one (1) each mentioned tracking performance and attendance; and two (2) talked of learning from the iMlango project by asking the head teachers and the iMlango champion teachers. During the KII, details of how they make decisions regarding iMlango emerged. They include: monitoring visits to schools to see if the system is working (Kajiado), during school board meetings (Kajiado), when they review the reports shared with them from the schools (Kilifi, Makueni), during school visits, asks the head teacher and the iMlango champion teachers questions to learn more (Uasin Gishu), and also during teachers' meetings (Uasin Gishu).

Indicator 3: Percentage of headteachers using the attendance and learning reports to drive decision making and support actions in the schools (quantitative)

The school survey targeted a total of 20 headteachers in treatment schools, and had an item on use of the attendance reports and the learning reports to make decisions and plan for support actions for the school. The item sought to establish the proportion of headteachers that used such reports. The responses (16 or 80%) to the item were always (5 headteachers), sometimes (11 headteachers) and never (none of the headteachers). Data on how often the headteachers used the attendance to make decision or what decisions were informed by these data were not collected at baseline.

Indicator 4: Percentage of headteachers with improved perception on improvements in decision making processes as informed by iMlango reports made (qualitative)

From the qualitative data analysis, it emerged that headteachers were optimistic that the project generated reports on attendance will be useful in tracking students' school attendance, link it with performance and use it to engage with parents. For instance, of the 10 headteachers who responded, 9 had the perception that iMlango reports improve decision making citing being able to track performance of learners, track their attendance, monitor teachers' performance; also upon receiving information from the project.

5.5.3 Interpretation and reflections

On the use of reports to drive decision making, the targeted numbers were too low to be conclusive on the use of reports through the quantitative data collected. However, during the KII with headteachers, they spoke of several ways in which they use iMlango data. One way is to track attendance and take remedial measures when necessary. This is illustrated by the headteacher from Kilifi as shown below,

"So it helps in that we are able to track the child where it is. You note that for a number of days this child has not been attending school and so we get in touch with the parents and alert them so that we can be able to know the challenge this child is facing. Therefore it is helpful" (Ngomeni, Kilifi).

Many headteachers said that they use the reports from the system to track pupils' performance. One teacher participating in FGD in Makueni spoke of how after looking at the data, the head teacher occasionally calls for a teacher's meeting to discuss improvement measures. See below a quote from a

head teacher in Makueni speaking of the ease with which he interprets performance information from iMlango

''It is really very useful to me because you know as an administrator, it is not very easy to know what is happening at the same time in the classes. So you see, when you get feedback from iMlango, because we normally get feedback. When you are on green then your data is very ok and when you are on yellow, it is a bit….but when you are on red then you have done nothing (Malindi, Kilifi)''.

Another use of the iMlango data cited by the head teachers was tracking of attendance to the labs by the pupils. In one case (Makueni), the head teacher could relate frequency of attendance to the lab and good performance by a particular pupil.

''For example the year 2016, we had a girl who was very frequent in Science checkup in the ICT room that is computer room. That girl scored a straight A of 84 and no any other pupil when we went through the data, the iMlango data; we were very surprised because that girl almost checked in Science content almost every day. And then we were amazed because the girl did well in that subject very much'' (Mbooni,Makueni).

The head teachers can access portal usage data via dashboard in order to evaluate the students level of engagement with the Maths-Whizz content as mentioned below by a headteacher in Makueni.

"Yes. It helps me because you find, for example in the portal usage, you find most girls have more interest than the boys. Like in our afternoon classes, we have scheduled for a lunch class and afternoon class, you find the girls are the ones pushing the teachers, "We want to go for our computer lesson at this time," but the boys are not very much interested. We just push them to attend to. So the girls, it has a positive impact to the girls, they want to learn" (Kiungwani, Makueni).

Some of the head teachers spoke of taking advantage of the availability of internet to send reports to Ministry of Education and Teachers Service Commission (Ngomeni, Kilifi County).

6. Conclusion & Recommendations

6.1 Conclusions

6.1.1 Profile of project beneficiaries and potential barriers to learning and transition

The project direct beneficiaries are about 70,000 girls attending about 205 iMlango schools spread across four counties of Kajiado, Kilifi, Makueini, and Uasin Gishu in Kenya. The indirect beneficiaries include about 70,000 boys attending the aforementioned iMlango schools, new entrants into the iMlango schools (about 17,500 per year), and about 12,000 per year non-iMlango boys and girls in targeted secondary schools, among others.

From the project design, potential barriers to girls' learning were based in four areas – community, parental/caregiver, school and teacher. From the EE analyses, we added three more areas, that is, economic marginalisation, child functioning and language difficulties. Overall, we conclude that most girls in the intervention are exposed to barriers related to household economic marginalisation. Results show that between 272 and 853 households are at risk of different barriers related to economic marginalisation. This translates to between 13% and 40% of households in the transition group. It is therefore logical for the project to intensify the microloans to targeted households to mitigate the economic related barriers. To illustrate the urgency of intensifying the mitigation, among the households who responded (738) to the barrier 'difficult to afford for the girl to go to school', half of them were at risk of experiencing this barrier. Similarly, among those who responded (853) to the barrier 'gone without cash income many/most days', slightly over half (57%) were at risk of experiencing this barrier.

Other than economic marginalisation, the other group of barriers with reasonably high levels of exposure are under teacher, school and language of instruction. Under the teacher category, girls from 1 in every 5 households exposed to 'teachers often absent from class' experienced this barrier – the exposed households were 495. Teacher absenteeism denies students learning opportunities and could ultimately see an increase in students' absenteeism. Headteachers, BOM and MoE officials have therefore a big role to play in monitoring and mitigating teacher school attendance.

Under the school category, the key barrier identified was 'drinking water facilities', with about 11% of the 283 exposed households identifying this as a barrier. Access to clean drinking water is essential in improving school health and hygiene, and this could reduce the risk of opportunistic infections among the school population. The language of instruction in most schools visited was mainly English, with a few other schools using Kiswahili. Of the 1,197 households whose girls were exposed to 'LOI different from mother tongue' 81% cited this as a barrier. The introduction of ICT in schools, therefore, provides an opportunity to close the gap created by LOI, especially in offering learning opportunities to students who would like to improve their competence in LOI.

6.1.2 Baseline learning levels

At baseline, the overall mean literacy score for the girls in the intervention group was 45.4% and this did not differ significantly from that of the girls in the control group, which was 46.1%. When the data were split by grade, the mean literacy scores for the girls in the intervention and control group were 25.3% and 26.8% for Grade 2 respectively, 52.6% and 53.7% for Grade 6 respectively, and 57.4% and 57.1% for Grade 7 respectively – an indication that the difference in literacy achievement between the two groups was minimal.

Likewise, the overall mean literacy score for the girls in intervention (49.9%) and control (48.9%) groups did not differ much – indicating existence of baseline balance in regards to numeracy achievement. Splitting

the data by grade, the mean numeracy scores for the girls in the intervention and control groups were 28.8% and 28.7% for Grade 2 respectively, 57.5%, and 56.3% for Grade 6, and 62.4% and 62.3% for Grades 7 respectively – showing that the differences in numeracy achievement between the two groups was not much – thus, existence of baseline balance.

There were also minimal differences in terms of learning achievement across the four counties. Nevertheless, the overall (i.e. intervention and control data pooled together) mean literacy score was lowest among girls in Kilifi (43.8%) and highest among girls in for Kajiado (46.7%), while the opposite was the case for the overall mean numeracy score – lowest in Kajiado (48.3%) and highest in Kilifi (51.1%).

Learning skill gaps in numeracy were observed in the areas of subtraction, algebra, and data interpretation. On the other hand, the skill gaps in literacy were evident in all areas of comprehension and in short essay. Surprisingly, results revealed that about one-half (54%) of the girls in the targeted grades (2, 6, and 7) had only achieved grade 2 level of competence in literacy.

6.1.3 Baseline transition levels

When considering the data for all age groups and for both intervention and control groups pooled together, the baseline in-school progression was estimated to be around 67.2%. Nevertheless, the overall in-school progression among girls ranged from 61.1% for those aged 8-11 years to around 85.0% for those aged 16-18 years. There were some substantial differences in transition outcome among girls in the intervention and control groups but these differences should be interpreted with caution because there were only a few girls involved in most cases.

6.1.4 Sustainability scores

On a range of 0-4, the sustainability scores were 2.17, 2.5 and 1.75 for the school, community and system levels, respectively. The overall score was 2.14, just above average. From these scores it would seem that the community is better prepared to sustain the project compared to the schools and the larger ecosystem. This implies that the project will have to work more with schools and the wider environment on sustainability strategies for the project – and perhaps look at it as mechanisms. The indicators for sustainability) at the community level were well scored (2.5); while at school level, education aspiration among boys and girls seem to be driving sustainability. At the system level, the low scoring came from the indicator on 'advocacy of county level education officials (DEO & CSO) for changes to existing education system (policy, resources, processes) as a result of learnings from intervention' with a score of 1.5. This perhaps could be one of the areas that the project may want to focus on.

6.1.5 Baseline levels of intermediate outcomes

School attendance

Results based on spot check showed high rates of school attendance among students in the intervention (91.1%) and control (91.2%). However, this is not the case for the school monitoring data that showed attendance rates of between 76% and 80% across grades. There was also no much differences in attendance when the spot check data were split by student gender. However, school attendance varied substantially when the spot check data were split by grade – with the lowest and highest rates recorded among grade 5 (86.7%) and grade 8 (95.6%) students, respectively. School attendance also varied by geographical location with the lowest rate recorded in Kajiado (82.5%) and Uasin Gishu (94.1%), respectively.

School governance and management

Results revealed that a vast majority of the parents in both intervention and control group perceived school to be either "extremely well managed" or "well managed". In addition, about two-thirds of the parents in both

the intervention group (67.7%) and control group (69.9%) perceived school management to have changed when compared to 12 months ago.

Quality of teaching
Over one-half of the girls in the intervention (56.9%) and control (59.7%) group reported that teachers often used different language (other than English) to help them understand lesson content. On the other hand, about one in every four girls in the intervention (76.3%) and control (76.0%) reported that teachers often encouraged students to participant during lessons (for instance by answering questions). Nine in every ten girls (with only a difference of 2.5 percentage points between intervention and control) thought that the teacher distributes difficult questions equally among boys and girls.

Community-based attitudes and behaviour
Key local community leaders were conversant with iMlango project activities and expressed interest to continue support it in areas such as (i) sensitization of the communities during the chiefs' barazas, (ii) ensuring all girls are in school by using the 'nyumba kumi' initiative, and, (iii) involving local political leaders and lobbying to have ICT in every school. Regarding girls, the local community leaders felt that inadequate learning by girls is mainly caused by parents giving chores to the girls and an 'un-written rule' that require girls to be home earlier than boys.

School-related, gender-based violence: Analysis of qualitative data did not show gender-based violence orchestrated by teachers. To the contrary, girls felt that teachers treat them in the same way they (teachers) treat boys. Most of the gender-based violence against girls is done by boys and takes place in and/or outside school. This included bullying by boys during the computer lab sessions and snatching seats form girls.

Economic empowerment
Among parents receiving stipends, qualitative data showed that the stipends helped reduce the burden of school levies on the parents. This was perceived to have resulted in improved school attendance among girls. A part from purchasing scholastic materials, the stipend (KES 500 or about USD 5) was also used to purchase other necessary items for the girl such as soap.

Life skills
Girls scored highly (in the expected direction) on the life skill items. For example, on a scale of 1 to 5, with 5=strongly agree on a positive statement, an overall mean of 4.7 on the item on 'I want to do well in school' meant that most girls tended strongly agree that they wanted good performance in school. There were very little difference in responses between girls in intervention and control schools.

6.1.6 Project approach to address gender inequalities

First, the project is addressing gender inequalities by improving teaching and learning environments to make them more conducive to girls. For instance, encouraging teachers to be gender sensitive during classroom lesson interactions by not favouring either girls or boys in the type of questions they ask. Likewise, schools are being encouraged to be more attractive and interesting by providing computers for use by students. Ultimately, improvement in learning and teaching environments would make the schools more attractive girls – thus, reducing the gender inequalities.

Second, the project is providing stipends and micro-loans to parents so as to reduce economic burdens to the families. This way, the family can support girls' education because they can afford to pay the costs associated with taking girls to school, and also reduce the opportunity costs associated with taking girls to school as well as reduce the push for families to marry off their girls at early ages.

Third, the project is empowering the girls by improving their life-skills. This way, incidences of cultural practices that are known to impede girls' education progress (e.g. FGM and early marriages) can be minimize.

6.2 Recommendations

Table 6-1and Table 6-2 present quality standards and functional areas for reference by the project team. Similarly, the EE uses these descriptions and it would help to have a shared understanding of some data quality standards.

Table 6-1: Data quality standards and operational definitions

Data Quality Standard	Operational Definition
Validity	Data are valid to the extent that they clearly, directly and adequately represent the result that was intended to be measured. Measurement errors, unrepresentative sampling and simple transcription errors may adversely affect data validity. Data should be periodically tested to ensure that no error creates significant bias
Reliability	Data reflect stable and consistent data collection processes and analysis methods over time. Reliability can be affected by questionable validity as well as by changes in data collection processes
Timeliness	Data are available with enough frequency and should be sufficiently current to inform management decision-making. Effective management decisions depend upon regular collection of up-to-date performance information
Precision	Data should be sufficiently accurate to present a fair picture of performance and enable project managers to make confident decisions[73]
Integrity	Data that are collected, analysed and reported should have a mechanism in place to reduce the possibility that data are subject to erroneous or intentional alteration

Table 6-2: Data quality system key questions by functional area

Functional Area		Key Question
I	Reporting Performance	Are the reports prepared completed?
		Were the reports prepared received on time?
II	M&E Structures, Functions and Capabilities	Are key M&E and data-management staff identified with clearly assigned responsibilities?
		What are the gaps in terms of M&E capacities, expertise and number of staff?

[73] More specifically, this dimension measures the level of accuracy in reporting of numbers (e.g.: does a number reported add up data as a "total"). Does the recording and reporting system avoid double counting people (e.g.: a person/student receiving the same service/training twice in a reporting period, a person/student registered to be receiving the same service/training in two different locations, etc.).

Functional Area		Key Question
III	Indicator Definitions and Reporting Guidelines	Are there operational indicator definitions meeting relevant standards that are systematically followed by all implementers?
		Has the project/activity clearly documented (in writing) what is reported to whom, and how and when reporting is required?
IV	Data Collection and Reporting Forms	Are standard data-collection and reporting forms systematically used?
		Is data recorded with sufficient precision/detail to measure relevant indicators?
		Are source documents kept and made available in accordance with a written policy?
V	Data Management Process	Does clear documentation exist on the collection, aggregation and manipulation steps?
		Are data quality challenges identified and are mechanisms in place for addressing them?
		Are there clearly defined and followed procedures to identify and reconcile discrepancies in reports?
		Are there clearly defined and followed procedures to periodically verify source data?

The iMlango project is generally well designed and at this stage, the EE does not propose any serious changes in its design. However, at midline, and after processing the midline data, it may be possible to understand if any changes in the design are necessary. That said, EE feels there may be need to introduce measures of implementation strength, that is, the dosage received at school, community and system levels. Our experience with education interventions show that implementation teams unintentionally provide different levels of 'doses' of the various elements of the intervention. This may cause different levels of impact. Understanding the dosage (e.g. frequency of visits to sites to deliver intervention, visits to CIHs, amount of stipend, timing of microloan, frequency of monitoring, quality of feedback to schools, frequency of use of ICT infrastructure and associated software, among others) helps the implementation team adjust the delivery of the intervention accordingly. Comparing the dosage and the emerging outputs and outcomes could help making decisions on the threshold and this could enhance intervention delivery. Such data, collected through the M&E system, could also help understand how schools will be expected to implement elements of iMlango in the post-intervention period.

7. Annexes

7.1 Annex 1: Logframe

The latest version of the Logframe has been submitted as an accompanying document to this report with name “iMlango-T Logframe 100918”.

7.2 Annex 2: Outcomes Spreadsheet

The latest version of the Outcomes Spreadsheet has been submitted as an accompanying document to this report with name “GEC-T iMlango Outcomes Spreadsheet v 6.4”.

7.3 Annex 3: Key findings on Output Indicators

This annex should be completed by the project.

Table 7-1: Output indicators

Logframe Output Indicator	Means of verification/sources	Collection frequency
Output 1: Improvement in teachers' knowledge, skills and attitudes in using ICT for teaching and learning		
Output 1.1: Number of numeracy and literacy whole class sessions using ICT run by teachers in primary schools per month	The in-field team will collect this information through a questionnaire that will be part of their school visits. Triangulation will be possible through the portal data.	Data collection will be termly and the average figures will be reported annually in the logframe. Reporting will be disaggregated by subject.
Output 1.2: % of teachers in school that have received training and support from iMlango ICT Champion	Training register gathered by ICT Champion on teachers trained and what they trained teachers on. Incentives for ICT Champions to have forms filled out by teachers to verify efficacy. This data will be disaggregated by gender.	Data collection will be termly and cumulative figures will be reported annually in the logframe.
Output 1.3: % of teachers that achieve more than 70% after completing an end of course assessment on micro-courses.	This will be evaluated with short tests after the completion of the micro-courses and the data will be available from the CLA portal. Some of the courses will be excluded because it is difficult to evaluate the targeted skills with a test. This data will be disaggregated by gender.	This data will be available on an on-going basis as teachers complete micro-courses and will be reported on an annual basis in the logframe.
Output 1.4: % of teachers from schools enrolling onto 3 or more micro-courses	This data will be captured by the CLA portal. This data will be disaggregated by gender.	Data will be available on an ongoing basis as teachers enrol in CLA and reported disaggregated by type of course (iMlango/non-iMlango) annually in the logframe.
Output 2: Improved individual engagement with iMlango resources by girls in primary schools		
Output 2.1: % of primary girls (and boys) who achieve more than 30 mins of Maths-Whizz usage per week during term time (weighted average)	Maths-Whizz central reporting system	This data will be available on an on-going basis, will be sex disaggregated, and reported termly. The logframe will be updated annually with the weighted average of the school terms.
Output 2.2: % of primary girls (and boys) who achieve 25 mins of literacy content usage per week during term time (weighted average)	iMlango portal reporting	This data will be available on an on-going basis, will be sex-disaggregated, and reported termly. The logframe will be updated annually with the weighted average of the school terms.
Output 2.3: % of primary schools implementing an ICT resource timetable	The project will work with each schools to create a timetable for how the resources (whole class and lab) should be used and a checklist to evaluate the schools against its implementation. The in-field team will evaluate the schools using the checklist on a monthly basis.	This data will be collected monthly.

Logframe Output Indicator	Means of verification/sources	Collection frequency
Output 3: Reduced financial barriers to education through delivery of stipend and microloans		
Output 3.1: % of stipend recipients that feel more able to support their child in regularly attending school as a result of the stipend	Questionnaires to stipend recipients and FGDs will be undertaken by the EE to monitor this indicator.	This data will be collected at Baseline and Midline.
Output 3.2: % of microloan recipients that feel more able to support their child in regularly attending school as a result of the microloan	Questionnaires to microloan recipients and FGDs will be undertaken by the EE to monitor this indicator.	This data will be collected at Midline and Endline.
Output 3.3: Microloan repayment rate	Project data on repayment rates and interviews/FGDs by the EE	Data on loan repayment rates will be collected by the project monthly but consolidated figures presented from midline onwards. The EE will triangulate the project data with microloan recipients interviews and/or FGDs.
Output 4: Improved girl engagement in girl club and CIH activities		
Output 4.1: Average number of girl club sessions run by primary schools per week	This will be captured through the usage data for the DLA content and triangulated with short surveys that the club facilitators will be asked to complete.	This data will be collected termly and reported annually in the logframe.
Output 4.2: Average number of girls (and boys) participating in the sessions per week	This will be monitored through an online survey with the girl club facilitators. This data will be disaggregated by gender.	This data will be collected termly and reported annually in the logframe.
Output 4.3: Frequency for each activity undertaken by the girl clubs	This will be monitored through an online survey with the girl club facilitators.	This data will be collected termly and reported annually in the logframe.
Output 4.4: Average number of girls visiting the CIHs per month	iMlango portal reporting and/or Self-reporting of facilitators/girls	The data collection method will depend on the implementation specifics of the CIHs. Data on this will be collected either through the portal using the logins as a proxy or through some method of self-reporting.
Output 5: Improvement in key stakeholder engagement to enable sustainability of girls progression through education		
Output 5.1: % improvement in net promoter score of the project	Key stakeholders (headteachers, CSOs, DEOs) will be asked to complete an online survey that will capture their net promoter score. This data will be disaggregated by gender.	Data will be collected termly and reported annually in the logframe.
Output 5.2: % of key stakeholders that view intervention as making a positive impact on their ability to do their jobs better	Key stakeholders (headteachers, CSOs, DEOs) will be asked to complete an online survey capturing their attitude towards the project. This data will be disaggregated by gender.	Data will be collected termly and reported annually in the logframe.

Table 7-2 presents the baseline status of the output indicators along with considerations about the relevance of these indicators for the ToC.

Table 7-2: Baseline status of output indicators

Logframe Output Indicator	Relevance of the indicator for the project ToC	Baseline status/Baseline values
	What is the contribution of this indicator for the project ToC, IOs, and Outcomes? What does the Baseline value/status mean for your activities? Is the indicator measuring the right things? Should a revision be considered? Provide short narrative.	What is the Baseline value/status of this indicator? Provide short narrative.
Output 1: Improvement in teachers' knowledge, skills and attitudes in using ICT for teaching and learning		
Output 1.1: Number of numeracy and literacy whole class sessions using ICT run by teachers in primary schools per month	Teacher usage of resources is one of the most important indicators that contributes to student learning.	The baseline value for this indicator is: • Literacy: 491 • Numeracy: 3,547
Output 1.2: % of teachers in school that have received training and support from iMlango ICT Champion	Understand the uptake by iMlango champions in undertaking the duty to train and support other teachers in school.	We proposed to revise this indicator – please refer to the Table 7-5 below for more details. Overall, cascade training from the iMlango Champions to the other teachers in the school has happened in 90% of the schools (184 out of the 205). • Kajiado: 85% (22 out of 26) • Kilifi: 91% (73 out of 80) • Makueni: 81% (30 out of 37) • Uasin Gishu: 95% (59 out of 62)
Output 1.3: % of teachers that achieve more than 70% after completing an end of course assessment on micro-courses.	This indicator provides a measure of the teachers' knowledge after taking specific micro-courses. 70%+ score based on evidence from micro-courses delivered in Tanzania. Single learning outcome courses attracted a higher pass rate given focused nature.	67.3%
Output 1.4: % of teachers from schools enrolling onto 3 or more micro-courses	This indicator will provide a measure of how many teachers have enrolled to the micro-courses available.	5.6%
Output 2: Improved individual engagement with iMlango resources by girls in primary schools		
Output 2.1:	When a pupil uses the Maths-Whizz Tutor for 30 minutes, their learning should progress at the expected international rate. If	The baseline value for this indicator is: • Girls: 4.94%

Logframe Output Indicator	Relevance of the indicator for the project ToC	Baseline status/Baseline values
% of primary girls (and boys) who achieve more than 30 mins of Maths-Whizz usage per week during term time (weighted average)	they use it for more than 30 minutes a week their learning should progress at a more than expected (i.e. accelerated) rate. This indicator shows how many pupils out of the whole cohort are meeting the conditions for expected and accelerated learning.	• Boys: 5.93% Further disaggregation for this is presented in Table 7-3. This data is a weighted average for Term 1 2018.
Output 2.2: % of primary girls (and boys) who achieve 25 mins of literacy content usage per week during term time (weighted average)	This is an important indicator for monitoring time on task that is necessary to ensure learning progress.	The baseline value for this indicator is: • Girls: 4.73% • Boys: 5.09% Further disaggregation for this is presented in **Error! Reference source not found.**.
Output 2.3: % of primary schools implementing an ICT resource timetable	This indicator will provide a measure for how well the schools engage with the project and integrate it in the timetable and learning/teaching practices. Part of this indicator is aiming to assess how teachers link lab time to learning objectives for students, how they manage students' access to the lab as well as the students that stay behind in the classroom.	We proposed to revise this indicator – please refer to the Table 7-5 below for more details. The baseline figure for the new indicator is 43% (60 out of 140 schools) overall in the project: County disaggregation • Kajiado: 85% (22 out of 26) • Kilifi: 91% (73 out of 80) • Makueni: 81% (30 out of 37) • Uasin Gishu: 95% (59 out of 62)
Output 3: Reduced financial barriers to education through delivery of stipend and microloans		
Output 3.1: % of stipend recipients that feel more able to support their child in regularly attending school as a result of the stipend	This indicator provides a qualitative measure regarding the views that the stipends recipients have about the impact of the stipend.	Table 7-4 shows the analysis of the responses by 31 parents who benefit from stipends through iMlango Project. When asked what benefits the stipends has brought to the education of their daughters, 24 of them had positive responses including improved attendance (8), improved performance (5); reduced financial burden at home (11). Seven (7) respondents were not unequivocal in their responses. The baseline value for this indicator is therefore 24/31 = 77%.
Output 3.2: % of microloan recipients that feel more able to support their child in regularly attending school as a result of the microloan	This indicator provides a qualitative measure regarding the views that the microloan recipients have about the impact of the microloan.	N/A

Logframe Output Indicator	Relevance of the indicator for the project ToC	Baseline status/Baseline values
Output 3.3: Microloan repayment rate	Loan repayment data will be readily available to the project for managing the microloan initiative but the EE will enable further explanations for how repayment works from the recipients' point of view.	N/A
Output 4: Improved girl engagement in girl club and CIH activities		
Output 4.1: Average number of girl club sessions run by primary schools per week	This indicator is important to monitor the engagement of the schools and mentors in running the girl clubs.	N/A
Output 4.2: Average number of girls (and boys) participating in the sessions per week	As participation in the girl clubs is voluntary this indicator will provide insight in the reach of the girl clubs.	N/A
Output 4.3: Frequency for each activity undertaken by the girl clubs	The club activities are selected by the club facilitators so this indicator will capture the different activities that are happening in the clubs including the use of My Better World content, income generation tool also following up with more specific questions about how these activities are implemented and their results.	N/A
Output 4.4: Average number of girls visiting the CIHs per month	Similarly to the indicator above it is important to understand the reach of the CIH and the number of girls that visit them.	N/A
Output 5: Improvement in key stakeholder engagement to enable sustainability of girls progression through education		
Output 5.1: % improvement in net promoter score of the project	The Net Promoter Score provides an indication of the degree to which project participants value the iMlango project and are likely to act as promoters for it. A score of 9-10 indicates that, on average, participants are more likely to be promoters.	• County Officials (1 male): 10 • County Officials (6 females): 6.9 • Headteachers & deputy headteachers (37 males): 8.8 • Headteachers & deputy headteachers (7 females): 8.1
Output 5.2: % of key stakeholders that view intervention as making a positive impact on their ability to do their jobs better	Exploring whether and how key stakeholders are benefitting from the project links to them supporting the project and to help the various activities perform better.	Key stakeholders have been asked through a questionnaire using a scale from 1 to 10. For the baseline values below we assume that the response is positive if they have answered with 9 or 10: • Headteachers & deputy headteachers (n=44): 52.3% • Curriculum Support Officers (n=4): 0%

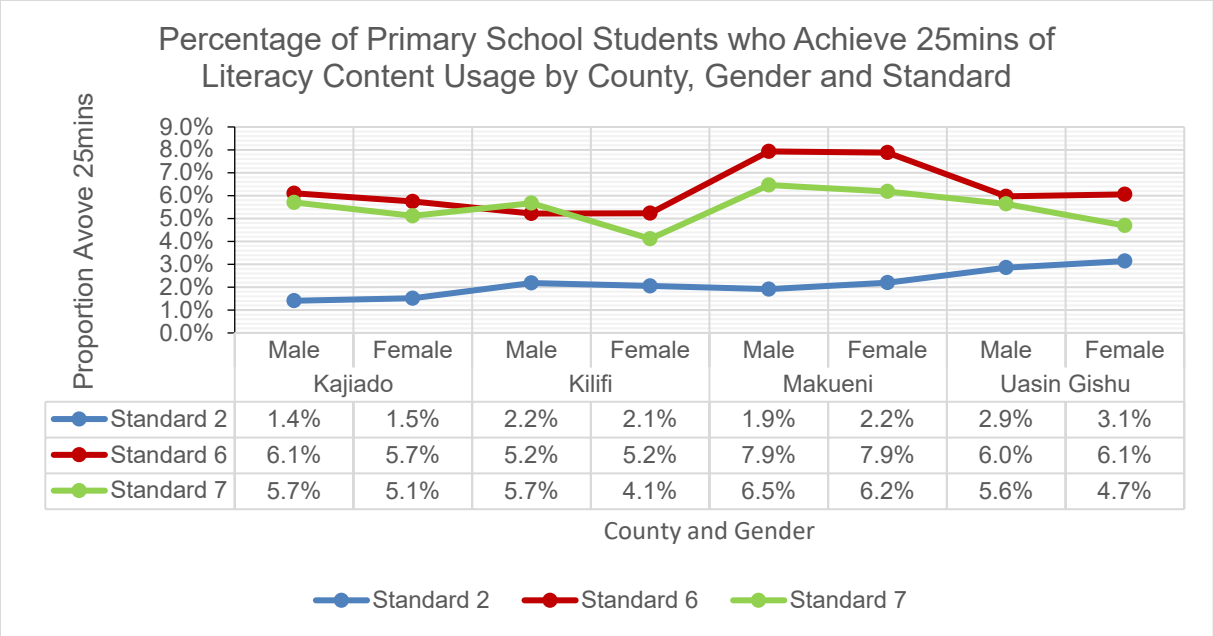


Figure 7-1:% of primary girls (and boys) who achieve 25 mins of literacy content usage per week during term time (weighted average)

Table 7-3: Percent of students using Maths-Whizz in a recommended way

County	Grade 2		Grade 6		Grade 7	
	Female	Male	Female	Male	Female	Male
Kajiado	1.87%	1.29%	11.37%	18.24%	7.81%	7.51%
Kilifi	10.26%	13.25%	7.51%	7.64%	3.33%	3.48%
Makueni	0.93%	0.00%	2.55%	2.59%	1.70%	0.90%
Uasin Gishu	6.87%	6.35%	4.05%	7.13%	2.73%	3.89%
Total	**6.88%**	**7.71%**	**5.97%**	**7.83%**	**3.39%**	**3.56%**

Table 7-4: Parents views on stipend effect

IDI Parent Sub-county/County	Respondent	Positive Views Expressed			Not Unequivocally Positive Views Expressed
		Attendance	Performance	Lighter financial burden / Girl health improved	
Kajiado 1	R1			X	
	R2		X		
	R3			X	
	R4				X
Kilifi 1	R1				X
	R2	X			
	R3			X	
	R4		X	X	
	R5	X		X	
	R6				X
Kilifi 2	R1	*'I am very grateful because the other day my child was sent away because of school uniform and she went and picked one from the shop. She benefitted from that and I am grateful. Another time she went and picked a sweater'.*			
	R2		*'She is performing well in school'*		
Kilifi 3	R1				X
	R2			X	
	R3			X	
	R4	*'Just as I mentioned the first time, children's attendance to school improved because the problems kind of reduced'*			
	R5			X	
Makueni 1	R1			X	

IDI Parent Sub-county/County	Respondent	Positive Views Expressed			Not Unequivocally Positive Views Expressed
		Attendance	Performance	Lighter financial burden / Girl health improved	
	R2			X	
	R3			*'Yes, I go take food and books and pens and then instead of going to buy books at the bookshop, I use the money for their school'.*	
	R4			X	
	R5				X
	R6		X		
Makueni 2	R1	X		X	
	R2			X	
	R3	*'It really improved because those who had dropped out had returned'.*			
Uasin Gishu 1	R1	X	X		
	R2			X	
	R3			X	
	R4				*'In her education, she had improved but now I have noticed her performance has started dropping and that I think it is company …'.*
	R5				X
	R6	*'Before iMlango the child was troubled. I was worried about how she will go to school. You know if you don't get soap the child will stay at home because her clothes are dirty'.*			
Total	**31**	**8**	**5**	**11**	**7**

After looking at the baseline values of the output indicators, we have listed at the table below any consideration and proposed changes.

Table 7-5: Output indicator issues

Logframe Output Indicator	Issues with the means of verification/sources and the collection frequency, or the indicator in general?	Changes/additions
	E.g. inappropriate wording, irrelevant sources, or wrong assumptions etc. Was data collection too frequent or too far between? Or no issues?	E.g. change wording, add or remove sources, increase/decrease frequency of data collection; or leave as is.
Output 1: Improvement in teachers' knowledge, skills and attitudes in using ICT for teaching and learning		
Output 1.1: Number of numeracy and literacy whole class sessions using ICT run by teachers in primary schools per month	For this indicator we intended to ask the teachers through a questionnaire about the number of whole class sessions that they run and triangulate with the login data from the portal and Maths-Whizz. From the baseline analysis of the data collected, it looks like the teachers overestimate the number of sessions that they run. Based on the questionnaire results, the number of sessions across the teacher population are: • Literacy sessions per month: 28,400 • Numeracy sessions per month: 27,900 These numbers are significantly higher to the ones we get from the logins so we need to investigate further the source for this indicator.	We need to review the source for this indicator as the questionnaire is not providing accurate information for whole class sessions.
Output 1.2: % of teachers in school that have received training and support from iMlango ICT Champion	While collecting the data for this indicator we realised that the number of teachers trained is not the best indicator to track as the not all teachers might be requiring assistance from the Champion.	We propose this wording for the indicator: % of schools where the iMlango Champions have delivered training to support the other teachers. The field officers are capturing information from each school regarding what the training was on and reasons why training did not happen in some schools.
Output 1.3: % of teachers that achieve more than 70% after completing an end of course assessment on micro-courses.	N/A	N/A
Output 1.4: % of teachers from schools enrolling onto 3 or more micro-courses	N/A	N/A
Output 2: Improved individual engagement with iMlango resources by girls in primary schools		

Logframe Output Indicator	Issues with the means of verification/sources and the collection frequency, or the indicator in general?	Changes/additions
Output 2.1: % of primary girls (and boys) who achieve more than 30 mins of Maths-Whizz usage per week during term time (weighted average)	The wording should be improved to clarify that we are capturing all girls (and boys) that achieve 30 mins or more of Maths-Whizz usage per week during term time.	Updated wording: % of primary girls (and boys) who achieve 30 mins or more of Maths-Whizz usage per week during term time (weighted average)
Output 2.2: % of primary girls (and boys) who achieve 25 mins of literacy content usage per week during term time (weighted average)	N/A	N/A
Output 2.3: % of primary schools implementing an ICT resource timetable	As we were trying to collect the data for this indicator, we realised than although almost schools have a timetable it was difficult to decide the level of usage that would indicate that a school is implementing the timetable.	We propose this wording for the indicator: % of schools that have resource utilisation of 40% or more over the course of a term We define utilisation to be the total time spent on the project resources divided by the total maximum time given the number of devices in the school, the number of teaching hours and number of days in the term. We have applied a discount in the total number of available days in a term to account for school holidays, electricity issues etc. Please note that this indicator is only considering Group A/C schools where a lab is available.
Output 3: Reduced financial barriers to education through delivery of stipend and microloans		
Output 3.1: % of stipend recipients that feel more able to support their child in regularly attending school as a result of the stipend	N/A	N/A
Output 3.2: % of microloan recipients that feel more able to support their child in regularly attending school as a result of the microloan	N/A	N/A
Output 3.3: Microloan repayment rate	N/A	N/A
Output 4: Improved girl engagement in girl club and CIH activities		
Output 4.1: Average number of girl club sessions run by primary schools per week	The indicators for this output will need to be revisited prior to the midline to decide relevant indicators for the girl clubs and the OOS girl activities.	N/A
Output 4.2:		

Logframe Output Indicator	Issues with the means of verification/sources and the collection frequency, or the indicator in general?	Changes/additions
Average number of girls (and boys) participating in the sessions per week		
Output 4.3: Frequency for each activity undertaken by the girl clubs		
Output 4.4: Average number of girls visiting the CIHs per month		
Output 5: Improvement in key stakeholder engagement to enable sustainability of girls progression through education		
Output 5.1: % improvement in net promoter score of the project	N/A	N/A
Output 5.2: % of key stakeholders that view intervention as making a positive impact on their ability to do their jobs better	The only issue with this indicator was that we were able to get limited responses from the Curriculum Support Officers (n=4). We will need to review the way we deliver this survey to county officials so that we are able to get more responses.	N/A

7.4 Annex 4: Beneficiary tables

This annex should be completed by the project.

Table 7-6: Direct beneficiaries

Beneficiary type	Total project number	Total number of girls targeted for learning outcomes that the project has reached by Endline	Comments
Direct learning beneficiaries (girls) – girls in the intervention group who are specifically expected to achieve learning outcomes in line with targets. If relevant, please disaggregate girls with disabilities in this overall number.	68,476	68,476	The total number of girl beneficiaries includes all the girls registered in the sQuid attendance monitoring system.

Table 7-7: Other beneficiaries

Beneficiary type	Number	Comments
Learning beneficiaries (boys) – as above, but specifically counting boys who will get the same exposure and therefore be expected to also achieve learning gains, if applicable.	69,651	This includes all the boys registered in the sQuid attendance monitoring system.
Broader student beneficiaries (boys) – boys who will benefit from the interventions in a less direct way, and therefore may benefit from aspects such as attitudinal change, etc. but not necessarily achieve improvements in learning outcomes.	N/A	
Broader student beneficiaries (girls) – girls who will benefit from the interventions in a less direct way, and therefore may benefit from aspects such as attitudinal change, etc. but not necessarily achieve improvements in learning outcomes.	N/A	
Teacher beneficiaries – number of teachers who benefit from training or related interventions. If possible /applicable, please disaggregate by gender and type of training, with the comments box used to describe the type of training provided.	Male teachers: 3,185 Female teachers: 2,052	This includes all the teachers working in the iMlango schools and registered as teachers in the portal.
Broader community beneficiaries (adults) – adults who benefit from broader interventions, such as community messaging /dialogues, community advocacy, economic empowerment interventions, etc.	• 2,000 MF recipients by the end of the project (conservative estimate). • 10,000 parents reached through sensitisation/community education activities. • 6,000 stipend parents at max. during Y1 of the project.	

Table 7-8: Target groups - by school

School Age	Project definition of target group (Tick where appropriate)	Number targeted through project interventions	Sample size of target group at Baseline
Lower primary	X	23,383	1,273
Upper primary	X	45,093	2,635
Lower secondary			
Upper secondary			
Total:		**68,476**	**3,908**

Table 7-9: Target groups - by age

Age Groups	Project definition of target group (Tick where appropriate)	Number targeted through project interventions	Sample size of target group at Baseline
Aged 6-8 (% aged 6-8)	X	5,347	777
Aged 9-11 (% aged 9-11)	X	21,200	736
Aged 12-13 (% aged 12-13)	X	19,132	1,427
Aged 14-15 (% aged 14-15)	X	15,316	747
Aged 16-17 (%aged 16-17)	X	6,339	157
Aged 18-19 (%aged 18-19)	X	1,044	24
Aged 20+ (% aged 20 and over)	X	98	1
Total:		**68,476**	**3,869**

Table 7-10: Target groups - by sub group[74]

Social Groups	Project definition of target group (Tick where appropriate)	Number targeted through project interventions	Sample size of target group at Baseline
Disabled girls (please disaggregate by disability type)			
Orphaned girls			
Pastoralist girls			
Child labourers			
Poor girls	X	c34,200	
Other (please describe)	X (This refers to girls that are educationally marginalised)	Educationally marginalised: c40,000 Socially marginalised: c27,300	
Total:			

Table 7-11: Target groups - by school status

Educational sub-groups	Project definition of target group (Tick where appropriate)	Number targeted through project interventions	Sample size of target group at Baseline
Out-of-school girls: have never attended school			
Out-of-school girls: have attended school, but dropped out	X		
Girls in-school	X	68,476	3,908
Total:		**68,476**	**3,908**

[74] Numbers are estimated on the % of girls the project thinks are affected by the different marginalisation factors as per the definitions in Section 3.1 and the total number of beneficiaries as captured in Term 3 of the 2018 school year that is shown in Table 7-6.

7.5 Annex 5: MEL Framework

The latest, FM-approved version of the MEL Framework has been submitted previously with file name “Draft iMlango-T MEL Framework v2.4”.

7.6 Annex 6: External Evaluator’s Inception Report (where applicable)

The final Inception Report has been submitted as an accompanying document to this report with name “iMlango APHRC MSL GEC-T External T Evaluation Inception Report v1.5 FINAL”.

7.7 Annex 7: Data collection tools used for Baseline

The finalised tools after the piloting had been shared with the FM previously.

7.8 Annex 8: Datasets, codebooks and programs

The datasets and codebooks have been submitted to the FM.

7.9 Annex 9: Learning test pilot and calibration

Please refer to the pilot report named “iMlango-T Evaluation Baseline Pilot Report v1.3” that has been shared before the baselined data collection with the FM.

7.10 Annex 10: Sampling Framework

The latest version of the Sampling Framework has been submitted as an accompanying document to this report with name “iMlango Transitions Sampling Framework v5”.

7.11 Annex 11: Control group approach validation

This annex serves to reflect on the adequacy of the learning and transition cohort samples, particularly the control group one, for the evaluation of outcomes at midline and endline.

7.11.1 Identifying learning and transition cohorts of girls for the intervention and control group

A similar approach was used to identify and select girls for both intervention and control schools. The learning and transition cohorts were selected at the primary schools during the baseline study in Grades S2, S6 and S7. For the learning cohort, 11 girls were randomly selected from each of the target grades, to make a total of 33 girls in each school. From the 11 girls selected from each grade, the transition cohort was randomly selected so that 7 girls were selected from each of Grades S2 and S6 and 8 girls were selected from Grade S7. By design, the transition cohort is a subset of the learning cohort. Girls in the learning and transition cohorts will be tracked at both midline and endline evaluation point.

7.11.2 Comparability of intervention and control group

The following points should be made for comparability between the intervention and control group:

- Different subgroup analyses are presented in the baseline report and they will be repeated at midline and endline. This has the potential of bias towards positive and/or negative findings that could emerge at the sub analysis level especially when it comes to making conclusions. It should be remembered that the analysis is powered to detect learning and transition outcomes at program level. Conclusions should be based on the entire sample and the design of the study.
- The evaluation uses mixed methods approach, which is a powerful approach. However, there could be a risk of ignoring certain results in favour of others. For example, qualitative narrative could be

appealing and self-serving, and outline some 'good' results even when results at program level show no successes.

- Schools were matched with their neighbours at sub-county level using the criterion of nearest neighbour. The assumption made was that girls attending neighbouring schools experience similar contexts that drive both intermediate (IO) and ultimate outcomes (O). That is, the unobservable are time-invariant. If this assumption is wrong, then it could bias the interpretation of the results – in particular this could overestimate the effect of iMlango.
- We do not think contamination is a concern given the amount of resources invested in and the range of activities in iMlango project. For example, control schools would have to train their teachers using similar protocols to those of interventions schools; build and equip ICT labs in large numbers (not just a few schools) and receive stipends, among other iMlango inputs. It is unlikely that all these would happen to an extent that it would be impactful in control schools.
- Spillover effects are real and they could be experienced by girls in control schools. For example, due to information flow on the need to support girls' education, social and economic interactions among households/girls within the same locality, and the fact that iMlango activities may lead to enhanced school attendance, peer influence may see attendance also enhanced in control schools. This could lead to an underestimate of the treatment effect.

7.11.3 Intervention and control sample compositions

Learning and transition sample breakdown by County, Grade, age and disability are presented in Table 3-1, Table 3-2, Table 3-3 and Table 3-4 in Section 3 respectively.

Table 3-1 shows the learning cohort consisted of 3,964 girls in total; 2,866 in the intervention group and 1,098 in the control group. Out of the four Counties, Kilifi had the largest share of intervention girls with 1,402 girls, while Kajiado with 442 girls had the smallest share. Table 3-2 shows that a vast majority of the girls in both learning and transition cohorts were in upper primary school grades (Standards 6 & 7), while Table 3-3 shows that a considerable number of the girls in the learning cohort were 13 years old or younger – as expected given that the girls are in primary school.

The sample appears to be fairly well distributed across these attributes (region, age, grade and subgroups) though heavily leaning towards the treatment arms. This is justified by the fact that treatment arms were more than one (A+C, and B). Though showing such distribution is necessary, it is not sufficient to determine full representativeness of the wider beneficiary. Such distribution should be viewed in the context of the power calculations presented in the report, and sampling procedures that allowed PPS and simple random sampling at all stages starting from sub-county going down to classroom. It should also be noted that the evaluation design allows effect of iMlango to be detected at the program and intervention group level but not at subgroup levels.

7.11.4 Differences between intervention and control group

DID is useful in comparing observed changes in the outcomes for the iMlango intervention and control groups. The key assumption in DID is in the selection bias that could emanate from the unobservable characteristics if they are not time-invariant – that is, the DID may not control for drivers of changes over time in the control group.

Looking at the overall differences between treatment groups and control group on key outcome variables, the control group is about the same as the treatment groups in many aspects. Regarding learning, Table 4-1 and Table 4-2 show no statistically significant difference at baseline scores between the two groups, at program level.

The following table summarises issues identified with using the DID approach and the related mitigation strategies.

Table 7-12: Identified issues with the DID approach and mitigation strategies

Issue identified	Mitigation strategy
Making program level conclusions based on sub analysis	Program level conclusions should be based on program level data and not sub group data. Sub group data will mainly help us understand what is going on in more detail.
Reporting appealing results	Results that are not based on entire sample should be treated with caution, triangulated and used to support and/or corroborate other pieces of evidence
Unobservable, time-invariant assumption, and use of DID	Pre-treatment differences between the two groups (treatment and control) that affect the growth rate should be noted. Possible factors driving such difference should be explored using regression methods at midline and endline.
Spillover effects	Ideally, this issue is mitigated through additional data collection to allow further investigation of participating groups and non-participating groups. This approach is suitable for randomised design and/or non-experimental approaches that utilise propensity score matching to identify participating schools. Further discussions could be held among iMlango partners on how best to capture the spillover effects – this may mean going beyond/outside the current samples.

7.12 Annex 12: External Evaluator declaration

Name of Project: iMlango Transitions

Name of External Evaluator: African Popluation and Health Research Center, and Maxell Stamp Limited.

Contact Information for External Evaluator: APHRC Campus, Nairobi, Kenya; Phone +254 20 4001000; email contact person: mngware@aphrc.org

Names of all members of the evaluation team (Technical team):

- Moses Ngware
- Julius Nguku
- Njora Hungi
- Daniel Mwero
- Steve Cygu
- Damazo Kadengye
- Elvis Wambiya

__**YES**____ (Name) certify that the independent evaluation has been conducted in line with the Terms of Reference and other requirements received.

Specifically:

- All of the quantitative data was collected independently – YES ((Initials: _MN___)
- All data analysis was conducted independently and provides a fair and consistent representation of progress - YES (Initials: _MN___)
- Data quality assurance and verification mechanisms agreed in the terms of reference with the project have been soundly followed – YES (Initials: _MN___)
- The recipient has not fundamentally altered or misrepresented the nature of the analysis originally provided by __Avanti & Fund Manager/PWC____(Company) (Initials: _MN___)
- All child protection protocols and guidance have been followed – YES ((initials: MN____)
- Data has been anonymised, treated confidentially and stored safely, in line with the GEC data protection and ethics protocols - YES (Initials: _MN___)

_____Moses Ngware_____

(Name)

____African Population and Health Research Center_____

(Company)

_____7th September 2018_____

(Date)

7.13 Annex 13: Project Management Response

This annex should be completed by the project.

Project Response to Key Baseline Findings

Table 7-13: Project response to key baseline findings

ID	Key Finding	Project Response
1	Economic marginalisation confirmed as one of the main barriers to learning and transition.	This was one of the barriers identified by the project and the stipend and microfinance initiatives have been designed to address this. Poverty can impact learning and transition in multiple ways; inability to pay the unofficial levies that the schools are asking, inability to buy uniform, inability to cover basic needs such as food, soap and sanitary towels for the girls or forcing the children to work part-time so that they contribute to the family income. Issues differ in each case, however the project has noted that parents receiving the stipend were usually purchasing food, soap, school accessories and uniforms (when available) from the local merchants. This fact, in combination with the improvement in the attendance of the students who received stipends, potentially indicates that some of these issues were alleviated successfully to the benefit of the students. The project has decided to move away from the unsustainable stipents and towards microloans to explore whether they can have the same effects while being more sustainable. Microloans are piloted at the moment, but we are aiming to explore their results in a similar way to the stipend. At this point we should note that although a big portion of our communities face poverty issues, it seems that the sub-group of girls from the poor families had only slightly worse learning test scores compared to the overall average. We would like to explore further what this means and would also like to see if this is still the case at midline. In light of the EE findings, the project will try to understand better how this barrier is manifested and review the design of these activities if necessary.
2	Teacher absence identified as a barrier to learning.	Teacher absence is unfortunately a reality in the schools that the project is operating in and a very sensitive issue to tackle. The project ability to address this is limited, however we will review with the headteachers and iMlango champions whether in such cases there is something that could help reduce the learning loss that the students are experiencing while their teachers are absent.
3	Absence of drinking water facilities identified as a barrier to attendance and therefore learning.	Although the project understands that this could be an important issue in the schools hindering attendance, we are not able to do anything about it apart from engage with the headteachers in these specific schools to encourage them to address it.
4	LoI identified as a barrier to learning.	During iMlango-1 this was highlighted by teachers in the schools as a barrier especially in Kilifi, although it had not been identified as a barrier in the baseline evaluation. This barrier was further supported by the poor iMlango-1 endline results in the reading section of the literacy tests. The project has since translated Maths-Whizz to Kiswahili so that the students and teachers can choose between English and Kiswahili when using it. For literacy this is more difficult to address as the project is being evaluated on literacy in English. The project will review what can be done to help address this barrier with the help of the literacy learning expert that is now working alongside the project team.
5	Physical punishment in the classroom	Questions on physical punishment from the teachers had not been asked during iMlango-1 so up until now we didn't have data on this issue from the EE. We also didn't have any data from our internal monitoring that this is happening in some of the iMlango schools. The project recognises that this teacher practice is against the Do No Harm policy of GEC-T and will

ID	Key Finding	Project Response
		endeavour to include a section on classroom management and acceptable ways of student punishment in the next capacity building session that will take place in Term 1 of the new school year in January 2020.
6	Low levels of pupil competency in higher-order literacy skills, namely comprehension	Pupils performed poorly in all of the higher-order literacy skills (the 3 levels of comprehension and short essay writing). Pupils' comprehension skills are underdeveloped across our school portfolio, which stems primarily from poor teacher knowledge in how to teach comprehension effectively. This problem is compounded where class sizes are large. The project will work directly with teachers on building their capacities in delivering effective comprehension-oriented lessons, particularly for upper primary. Developing pupils' 5 core foundational literacy skills first is also important as an enabler of comprehension knowledge.
7	Girls with self-care impairments and communication impairment perform lower in both literacy and numeracy indicating a barrier to education.	The project recognises that these groups of girls had poorer performance compared to the average across all girls. The project will need to investigate in the field to understand why these groups had poorer results and investigate can be done to help them. Based on the findings, the project will have to make a decision on whether it is able to address the issues that affect these girls' learning outcomes. When more information is available on this, the project will liaise with the FM to discuss further.
8	Discrepancies between attendance moniroting data collected by the project vs spot check data collected by the EE.	The attendance spot check data that the EE collected is consistently higher than the attendance monitoring data that the project collects daily. The attendance monitoring system has been successfully established during iMlango 1 and the project has full confidence about the accuracy and integrity of the data collected. Spot check data is very useful in understanding how the schools implement attendance monitoring in the schools without the el;ectronic system but it only provides a snapshot whereas the project data can show the trends over a continuous timeline. The project is not sure why the headteachers and spot checks overestimate the attendance rates but this is something that we have come across in iMlango 1. It would be useful to do some further analysis to see how the attendance monitoring system data compares to the spot check data on that specific day.
9	From the EE analysis under IO4 it seems that girls have high life skills scores which might have an impact on the girl club activities/design.	The project has used the standard life skills questions that were part of the GSS template provided by the FM, as we the DLA style girl clubs were not put in place for baseline. We have discussed with our gender and social inclusion consultant around these life skills questions and the project believes that the girls might have responded in an overly positive way. What the project is planning to do is follow a step approach regarding girl clubs: • Work with the DLA field officers to identify club mentors in each school; • Make the DLA content available through the iMlango portal for schools to access; • DLA field officers will train the club mentors so that they have the skills and confidence to facilitate the girl club sessions; • iMlango and DLA field officers will work together to help the mentors identify the appropriate content that will help addess the specific issues in the school that might influence girls' learning. For example, this could be early pregnancies, parents' views, other social norms etc. This process will have to remain flexible so that the mentors are empowered to identify the issues and help address them in the clubs.
10	Proof around IO5 on how the key stakeholders are using the iMlango data is weak.	The project feels that although this is an important strand of work, the evidence around it is weak at the moment. We are currently in the process of strengthening our cooperation with these key stakeholders and changing the way we share data with them to ensure maximum engagement. These stakeholders have already been involved in leadership trainings and the field staff visit them regularly. Along with the project activities to strengthen this

ID	Key Finding	Project Response
		strand of work, we would also like to discuss with the EE how we could improve the tools used to track the IO progress.

Project Response to EE Recommendations

Since there are no specific recommendations from the EE at this stage, the project will continue to implement the project as designed and increase efforts to drive up usage and exposure in the intervention schools, support teachers and headteachers through capacity building and field officer visits as well as further engage with the county level officials, parents, BoM and the wider community to support sustainability efforts.

Regarding the EE's recommendation to ensure that we provide the same support to all schools for comparability at midline, we feel is not that relevant to our intervention. School's engagement varies a lot and depends on numerous things such as headteacher engagement, teachers' support and dedication and community/BoM buy in. From our point of view, the support that schools receive is based on their needs so that we can maximise the chances of all students to be exposed to the intervention and achieve learning gains. The project also thinks that due to the strong internal data coming from the portal and Maths-Whizz we should be able to link the learning outcomes as measured by the EE with the levels of usage of the resources and therefore have a deeper understanding about how change is achieved.

Changes to the logframe proposed to DFID and the Fund Manager

Following the findings of the baseline report, the project would only propose to update the phrasing of specific Output Indicators as highlighted in Table 7-5 of Annex 3.

No other necessary has been highlighted by the EE or identified by the project at this stage. We will review again all indicators at midline to ensure that they are still relevant to the project activities.

7.14 Annex 14: sQuid Attendance Monitoring System

The project measures attendance for all students in the intervention schools through the sQuid attendance monitoring system. In the evaluation control schools, the project performs termly spot checks for the cohort standard. These termly spot checks captured data on attendance for the specific day for both boys and girls in the cohort standard.

Figure 7-2: Attendance smartcard and terminal

Throughout the project, schools have measured attendance daily on sQuid's digital attendance monitoring system. This has enabled real-time data reporting capabilities providing high reliability and insight in attendance patterns.

sQuid provides a contactless smartcard for students and an Android application (shown in Figure 7-3), able to record and monitor attendance. Once the teacher has taken attendance, the app stores the data locally until it communicates with the sQuid database to upload the secure records for the day. Each school is issued with Android attendance tablets (amount depends on the number of students) and every student is given a contactless iMlango card that they use to take attendance.

Every day the teachers hand out to students their cards that are kept in a central location at the school to avoid cases of loss. Each student taps the attendance smartcard on the attendance terminal which then records the card number, date and school ID therefore placing the student at that school for that particular day (see Figure 7-3).

One of iMlango's innovations has been the introduction of smartcard based electronic attendance in all intervention schools. We observed good usage of the attendance system and it is very likely that the data arising from the iMlango platform is far more reliable than any other data sources from these regions or these schools.

7.15 Annex 15: iMlango Portal and Resources

Students were issued with smartcards for digital attendance monitoring and these also provided the student login details for the learning portal. Time on portal and time on the digital components was measured electronically for all students. Once logged in, the student can choose to navigate through the available resources through selecting one of the boxes:

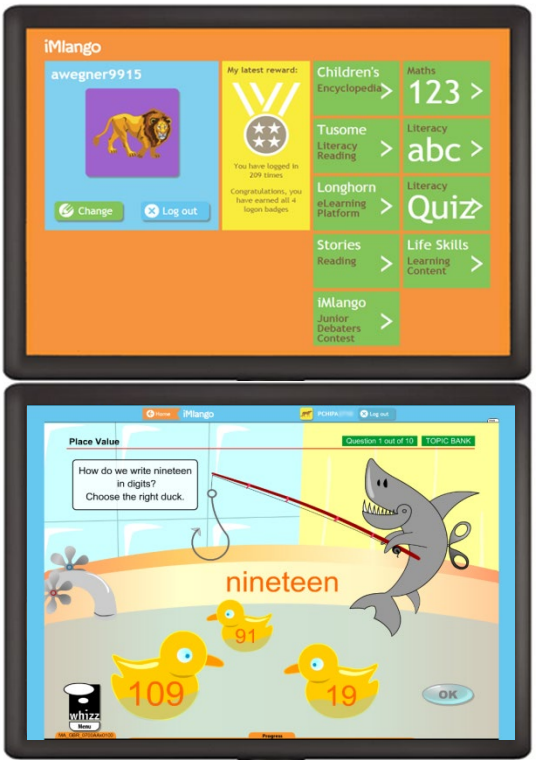


Figure 7-3: iMlango portal home page and Maths-Whizz lesson page

1. *Maths:* one of the core and innovative educational resources that is provided within the iMlango project is access to Maths-Whizz. Maths-Whizz is an individualised simulated tutor, designed to replicate the behaviour of a human teacher. It first diagnoses student's strengths and weaknesses across several maths topics through an adaptive assessment, which in turn creates a learning profile for each student showing where exactly they are within their learning journey, and what their strengths and weaknesses are. Based on that learning profile, the tutor then delivers a learning journey that is tailored to the individual needs and pace of learning of each student while being continuously adaptive. The tutor prioritises a student's weakest topics, covering knowledge gaps that may have held them back in the classroom environment;
2. *Literacy:* this includes e-books sourced through eKitabu covering Standards 1-5, alongside web applications that provide digitized exercise books for standards 1 and 2. These exercises allow for progression through the curriculum at a pupil's own pace;
3. *Stories:* this includes 58 stories from African Storybook both in English and Kiswahili for Standards 1-5, as well as 13 stories for pre-primary pupils. The main aim of these relevant, localized stories is to improve children's literacy, but several stories – such as the 'Crocodile in my Body' (discusses HIV/Aids) – also help inform children of potentially harmful situations that they might face;
4. *Children's encyclopedia:* this links to the Q-file webpage where the students can research a wide array of topics, from world history to the human body. This piece of content encourages independent, pro-active research into subject matter that is of interest to the pupil, also allowing for him/her to address a gap in their existing knowledge;
5. *Tusome:* this includes the MoE approved reading programme for Standards 1 and 2 that has been nationally rolled out in hardcopy form. The material is proven to improve reading fluency and reading comprehension, whilst enhancing teacher capacity in whole-class setting;
6. *Longhorn:* this provides curriculum-approved content and assessments to help prepare pupils for their end of year examinations, as well as the KCPE for those in standard 8. Longhorn is one of the biggest providers of learning material in Kenyan primary schools, and the portal provides comprehensive access to their digitised material for all subjects;
7. *iMlango Junior Debaters' Contest*: the iMJDC is aligned with the well-established, televised Great Debaters' Contest. The contest has proven very popular with the pupils that have participated in it so far, allowing for critical engagement in diverse topical debate areas. This provides pupils with the opportunity to work together (in teams of 5) to try and produce coherent and compelling responses to

the questions. Answers are submitted electronically via the iMlango portal. There are 3 rounds to each 'season' of the contest; one season has been completed, and one currently underway. Each season is available only to one standard: the first season was for Standard 7, the second (current) season for Standard 6;

8. *Life skills:* this includes the Good School toolkit from Raising Voices that is used in the child club sessions. This comprises 5 steps to achieving a well-functioning school, with content a mixture of posters to be created by the children and engaging stories led by the teachers. There is also a section on the importance of hand washing, with one of the iMlango school's child clubs creating the step-by-step process that's available to all through the portal.

Teachers are also given unique login details where they can access the resources for whole class teaching as well as access to Maths-Whizz live reports – a record of students' interactions with the tutor, including a range of usage and progress metrics – which they can use for their lesson planning. The Whizz Education field team also utilises the reports, proactively supporting schools and adapting the implementation at point of need based upon analysis of the data.