whizz EDUCATION

REPORT

JUNE 2021

ENABLING EDTECH ADOPTION: NUMERACY INSIGHTS FROM PROJECT IMLANGO

iMlango

CONTENTS

EXECUTIVE SUMMARY

Integrating our earlier findings on why schools adopt EdTech with internal end-of-project reflections, we now present four key insights for donors, project designers and implementers working in low resource settings.

iMlango was a flagship EdTech project operating in four rural counties in Kenya from 2015 to 2021[1]. Funded by the UK Foreign Commonwealth and Development Office (FCDO, formerly DFID) through the Girls' Education Challenge, it was an innovative public-private sector consortium which – among other things – equipped 245 schools with desktop computers, satellite internet connectivity and digital learning resources. The project aimed to improve literacy and numeracy outcomes, with a specific focus on girls.

This paper encapsulates Whizz Education's principal learnings about EdTech (in low-income contexts) based on our experience as the numeracy learning partner within iMlango. Drawing on quantitative data and project team insights, we introduce some teaching & learning-focused guidelines for successful EdTech adoption.

KEY FINDINGS

1. **Designated in-school 'enablers' are the vital EdTech project ingredient in lower-income contexts.** These individuals ensure that technology is integrated into (rather than divorced from or existing at the expense of) regular teaching & learning. They also set in train the process of sustainability, decreasing the level of reliance on project inputs.
2. **An evolving teacher training approach facilitates EdTech adoption.** In online training, form is wedded to content: teachers simultaneously build their subject-specific pedagogical skill and technical literacy. But a sequential professional development journey is required to get to this stage. The journey itself gradually builds whole-school agency (in terms of delivering learning through ICT) and addresses technophobia. The journey can be hastened, but not circumvented.
3. **Leaders in schools that use EdTech effectively display specific characteristics.** Empowerment, risk-taking and delegation are key. In exhibiting these behaviours, Head Teachers ensure consistent usage during the project life-span and prepare the way for sustainability afterwards. Big-picture thinking similarly drives engagement. Certain project inputs can stimulate and support effective leadership behaviours and mindset.
4. **2021 needs an EdTech success formula.** COVID reorients but does not dismantle our revised EdTech success formula, newly stated below. The formula informs thinking about sustainability and teacher agency and carries global lessons and applicability.

[1] *The project still continues in a reduced guise, albeit without external funding.*

CONNECTIVITY / ACCESS / PROACTIVE SUPPORT +

DESIGNATED IN-SCHOOL "ENABLER"

Ideally a teacher with reduced timetable, also possibly a paid ICT assistant, community volunteer or even a highly empowered student champion.

Works in close partnership with maths teachers, maintaining regular ICT lab access across the school, monitoring student activity within the lab and negating disruption to regular maths lessons.

+

TECH-SAVVY, ENGAGED TEACHERS

Whose engagement and technological skill has been cultivated through an **evolving teacher training approach** in the which form and content ultimately intertwine.

Which gradually builds whole school teacher agency over the process of delivering subject specific learning through ICT – plus ownership of their personal professional development.

+

EMPOWERING, RISK-TAKING SCHOOL LEADERSHIP

For e.g. a Head Teacher that is prepared to delegate ownership of the school ICT lab, **trusting and giving space to designated colleagues** to make decisions around its judicious usage.

Leads from the front, but focused on the big picture and possessing a long-term vision. Mindful of the value of education, including how ICT can support students' learning careers.

=

ADOPTION AND CONSISTENT, INDEPENDENT ENGAGEMENT WITH EDTECH

+ DEDICATED SUPPORT FROM EDUCATIONALLY-FOCUSED FIELD OFFICERS

INTRODUCTION

BACKGROUND

On 17th March 2021, iMlango field operations ended. Real-time learning data – the engine behind the flagship GEC EdTech project – ceased to be harvested at scale. This innovative, seven-year-long public-private experiment to generate learning gains for marginalised girls in Kenya through ICT, closed almost exactly a year after COVID-19 threatened to fatally undermine its central purpose.

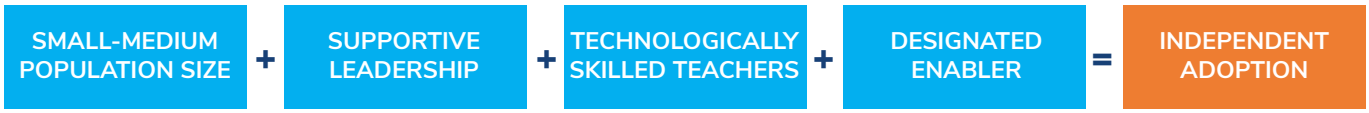
iMlango was a consortium-led project, operating in partnership with the Government of Kenya and the UK Department for International Development (DFID)[2]. The consortium was led by Avanti Communications and comprised Whizz Education, sQuid and Camara Education.

As numeracy learning partners within the consortium, Whizz Education provided individualised virtual tuition to project beneficiaries through the award-winning Maths-Whizz platform, alongside bespoke educational support, capacity building and resources for teachers. We are therefore well-placed to translate the unique experience of iMlango into practical guidelines for educational donors, project designers and implementers. We do so now, drawing on the rich analytics generated by Maths-Whizz, our extensive field experiences, and the jolting presumption check thrust upon us by the global pandemic.

This paper outlines some of the enabling factors and approaches which contribute towards EdTech adoption in low resource settings. It adds rigour to our preliminary findings from March 2020 and revisits them in the light of COVID.

PRELIMINARY FINDINGS

In March 2020 Whizz Education produced a Field Report entitled Why do Some Schools Adopt EdTech in which we attempted to define the enabling factors behind EdTech adoption within iMlango. The report classified 24 'independent' schools (from the full cohort of 140) that used Maths-Whizz consistently throughout the 2019 academic year. It then asked what these schools had in common, correlating them against a set of factors drawn from the literature on EdTech in low-resource settings. Summary conclusions pointed to the following success formula:



The Field Report was predominantly desk-based and noted a few caveats:

- Analysis of some factors was inconclusive.
- Deeper interrogation of the enabling factors was required to give a sense of causation.
- Analysing the full population of schools against the same set of factors would lend greater legitimacy to any findings.

Shortly after writing the report, the global pandemic struck. The extent to which the success formula continues to hold up in a post-COVID normality was therefore called into question.

[2] *Now FCDO (Foreign and Commonwealth Development Office)*

NOTE ON ACCESS AND CONNECTIVITY

Without the satellite connectivity, fully equipped ICT labs and proactive technical support provided by the project for every school, iMlango would not exist. Access and connectivity are therefore absolutely critical EdTech enablers. But they are not the focus of this paper.

In iMlango, all schools (by and large) had the same technical infrastructure and support systems in place. Basic device/connectivity/software issues were not uncommon, and cannot be overlooked in any future project design. When they reared their heads, these issues inflicted a devastating impact upon learning potential. But this phenomenon is neither new nor particularly useful to share. No EdTech project can get off the ground without considering access.

The importance of access is self-evident and unambiguous, and the conversation is familiar to those working within EdTech and development. The focus of this piece therefore is the less remarked upon teaching & learning-oriented enabling factors which we feel constitute a fresh and insightful addition to sectoral understanding.

METHODOLOGY

1. The 2020 Field Report discussed 24 'independent' schools within iMlango who appeared to have 'adopted' EdTech. To identify these schools, we employed daily Maths-Whizz Tutor usage throughout 2019 as the adoption metric, with 15 minutes of usage per student per week our notional indicator of 'consistency'. We then discounted: i) the known 'non-active' usage periods within the academic year (holidays, exam time); and ii) usage which appeared to have been directly stimulated by (and was therefore not independent of) a project field visit.[3]
2. Accepting a level of homogeneity within iMlango schools (e.g. same number of computers, same exposure to project treatments) we asked what characteristics these 24 schools had in common. We then mapped each school against various instrumental factors discussed in the literature on EdTech (in lower-income countries). These initial findings informed the 2020 report.
3. This year (2021), bearing in mind the caveats listed above, we undertook the same mapping exercise for the full cohort of 140 iMlango schools that had access to Maths-Whizz Tutor to determine whether what we were seeing were noteworthy phenomena or merely expected distributions.
4. Finally, we drilled down into the 24 'independent' schools to gain more insight into the findings. We conducted two semi-formal end-of-project focus group discussions[4] with Whizz Education Field Officers who had regular, direct contact with the schools throughout the project. The qualitative data from these discussions informs many of the findings presented below, including the reappraisal of some findings through the lens of COVID.

[3] See https://www.whizzeducation.com/our-work/research-thought-leadership/why-do-some-schools-adopt-edtech/ *p.3 for further detail.*

[4] *Field Officer comments have been presented accurately but with paraphrasing, hence why they do not always appear in quotes.*

FINDING 1.
DESIGNATED EDTECH ENABLERS: THE VITAL PROJECT INGREDIENT

BACKGROUND AND CONTEXT

The 2020 Field Report revealed a compelling finding.[5] Every one of the consistently engaging iMlango schools had a designated in-school individual with some responsibility for the operations within the ICT lab.

These individuals were not necessarily class teachers – or if they were, they often had a reduced timetable which enabled their involvement in their lab. They were also PTA teachers, school secretaries, community volunteers and paid lab assistants. The distinguishing point is that the individuals occupied a dedicated, project-specific, auxiliary role with 'extra' (i.e. non-business as usual) responsibilities. Their presence in schools appeared to reduce reliance on project officers and class teachers, demonstrably enabling lab timetable adherence and reducing disruption to regular lessons.

Our further analysis of the full cohort of iMlango schools validates this assertion. The high frequency of designated individuals in the 'independent' sample was not at all representative of a general trend in the wider iMlango population, as figure i. indicates:

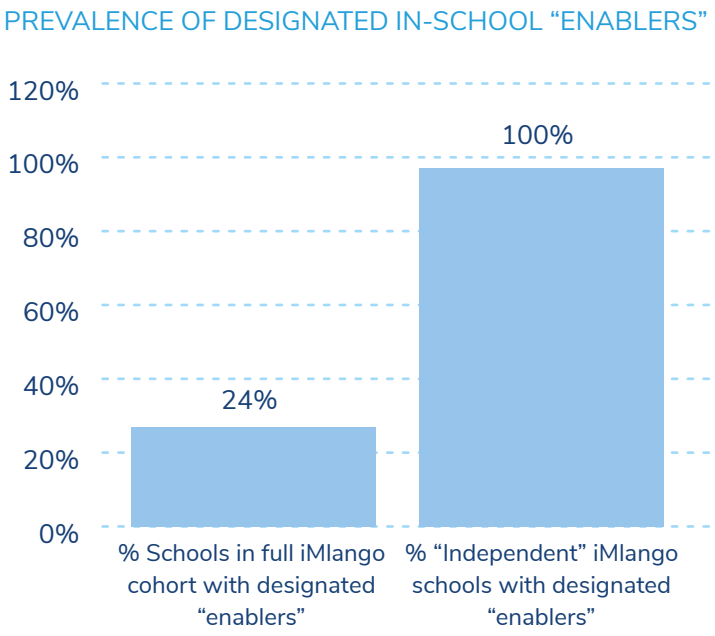


FIGURE I

There is a clear correlation then between designated individuals and 'independent' schools. All of the schools without a designated individual failed to exhibit consistent Maths-Whizz Usage during the reporting period. Furthermore, of the schools that did designate an individual to support the ICT lab, all but 10 displayed consistent usage[6].

[5] https://www.whizzeducation.com/our-work/research-thought-leadership/why-do-some-schools-adopt-edtech/, p.10

[6] *'Usage' refers to time on task on the Maths-Whizz virtual tutoring platform.*

KEY INSIGHTS FOR THE SECTOR:

A) DESIGNATED ENABLERS ENSURE THAT EDTECH DOES NOT EXIST IN PARALLEL TO – OR HAVE A DELETERIOUS EFFECT ON – CLASSROOM LEARNING.

This is particularly relevant for lower-resource settings with large class sizes. In many iMlango schools, maths teachers viewed supervising children inside the ICT lab as extra work. Certainly, it is a challenge to teach a class of 60+ students and simultaneously enable them to access Maths-Whizz (individually) in an ICT lab containing only 25 fixed computers. A number of scenarios therefore played out. Either students gained zero access to the lab. Or they had unsupervised access during non-lesson times only which was necessarily divorced from their classroom maths learning. A third option was that the maths teacher accompanied students to the lab during lesson time, providing a link between their Maths-Whizz experience and the regular curriculum – but in doing so, was forced to leave half of the class behind, sacrificing one of their scheduled weekly maths lessons. In each of these scenarios, net access to maths instruction declines.

A designated auxiliary individual with extra ICT responsibilities mitigates this loss. Lab sessions are supervised by a trusted colleague and can be collaboratively planned so that the maths teacher retains influence over their execution despite being (mostly) absent. Classroom maths lessons are undisturbed and take place concurrently. Crucially these are no longer parallel entities. The maths teacher can ensure good lab practices are being observed, having deputised monitoring duties to the designated enabler, and can still engage with the learning data post hoc. Groups of students attend in turn as part of their scheduled maths allocation. There is less conscious separation between what happens in the lab and the delivery of the maths syllabus, and indeed the two can underpin and reinforce each other.[7]

B) DESIGNATED ENABLERS MUST OPERATE IN CONCERT WITH OTHER STAKEHOLDERS.

Although the correlation with consistent EdTech usage is seductive, designated enablers are not a magic bullet. Ten schools with designated support individuals did not exhibit consistent usage. In these schools, we noted other human impediments at play. In one, a PTA teacher was delegated to be in charge of the computer lab, but the school administration was unsupportive. In another, similarly organised, the Whizz Education Field Officer explained that: 'Even though a PTA teacher was designated to be in charge of the computer lab...most teachers are almost retiring, therefore not interested in the project.' Elsewhere, the existence of the designated enabler(s) had a counterproductive impact. According to a Field Officer: 'Since the school has hired two assistants, teachers are not involved in running this project at all.'

There are many barriers to EdTech adoption which may explain inconsistent usage patterns. Designated in-school enablers are a viable, impactful solution to some of these. But they should not operate in isolation, and ideally will do so in concert and close communication with other teachers.

[7] *See also the explanatory model presented in:* https://www.whizzeducation.com/our-work/research-thought-leadership/why-do-some-schools-adopt-edtech/, *pp.11-12.*

C) DESIGNATED ENABLERS DISRUPT ANY PROJECT DEPENDENCY AND FACILITATE SUSTAINABILITY.

Throughout iMlango we observed a level of reliance among schools on Field Officer presence or direct project inputs. This is not unusual given the dynamics of a donor-recipient relationship, especially in an international development context, and with busy teaching schedules to contend with on top. However, it comes at the expense of proactive teacher engagement with resources and activities. Even six years into the project, we had difficulty motivating schools to proactively conduct Maths-Whizz reassessments in the ICT lab. Yet when an iMlango Field Officer was visible on the premises, executing the activity was straightforward. Buy-in to the concept of reassessments (to diagnose maths knowledge levels post-COVID) was not in question. Taking ownership of the process was.

Designated enablers evidently disrupt this norm. Their very role specification is to own ICT lab operations, thereby reducing any reliance on project staff. The 24 'independent' schools are the case in point. These schools used Maths-Whizz regularly and consistently, something that would not have been possible had it been contingent on their Field Officer's relatively infrequent visits.

The role therefore sows the seeds for sustainability. Whether donors and project designers stimulate this process through allocation of funding for a designated in-school enabler – at least for some part of the project lifespan – or attempt to foster the understanding among stakeholders that their appointment is imperative, is a question for separate consideration.

D) THERE IS A COST ASSOCIATED WITH DESIGNATING INDIVIDUALS TO SUPPORT THE LAB.

This cannot be downplayed. Schools are faced with either the physical cost of an additional salary, or the opportunity cost of reducing a class teacher's timetable (or indeed of a regular teacher doing overtime in the lab). For some schools, this was insupportable due to resourcing constraints. They would have 'liked to employ an individual', but cost was too significant a barrier. It is also true that there is an imbalance in distribution of teachers within Kenya, to the extent that not all schools had the luxury of an additional resource. For example, in one school which did have ICT specialists, the specialists could not be deployed to the lab due to a general paucity of classroom teachers.

In addition, funding from the MoE is clear on how it should be used. Appointing an ICT lead may mean having to reach out to parents for contributions, whose disposable income levels are variable. Education in Kenya is also largely centralised. Subjects and the number of lessons to be delivered each week are prescribed. There is no formal existing policy to allow schools to appoint an ICT lead (although projects could work together with the MoE to formally incorporate this into teachers' responsibilities).

E) BUT SCHOOLS THAT DESIGNATED AN INDIVIDUAL TO SUPPORT THE LAB DID SO BECAUSE THEY UNDERSTOOD THE EDUCATIONAL DIMENSION OF THE ICT ACTIVITIES.

For some schools, cost to the institution was a central and unnavigable barrier. Where resources were not the central issue, other priorities sometimes superseded the need for a designated enabler. A few schools were able to pay for a clerk to join the staff team to support administrative processes, but not to employ a lab assistant to support learning. Others did not have the capacity to create an effective timetable – meaning that even a school with ample teachers would not necessarily be able to deploy them judiciously to support the ICT lab.

But where designated enablers were present, the Head Teacher had usually embraced the overarching purpose of the project and recognised that an additional in-school support role was vital for running the ICT lab. Leadership was therefore key. In one school, the incoming Head Teacher quickly designated an individual to open and close the lab and ensure that the timetable was followed. The previous Head Teacher had never done so, and the difference in usage between their tenures was apparent.

Our 'independent' school leaders felt that an additional role could be maintained and were prepared to balance the cost of doing so against the perceived impact it would have. To return to the earlier point, they willingly disrupted the dynamic of reliance (on project officers). The dimensions of effective EdTech leadership will be discussed in detail in section 3, where we will also explore the extent to which these behaviours can be stimulated and supported through project design.

F) AND CHILDREN CAN BE DESIGNATED ENABLERS IN AN EDTECH PROJECT.

A number of iMlango schools appointed student champions to support the ICT lab. Sometimes this was alongside a designated adult enabler, and sometimes they were it. The linkage between student champions and consistent usage is less watertight, but it is certainly true that many of the duties of the enabler can be performed by a (trained and supported) child.

The iMlango approach was to work with schools to appoint two student champions per school – one boy and one girl. In late 2019 we developed a structured approach to recruiting, onboarding, supporting and recognising them, but COVID prevented this from being implemented at scale. Nevertheless, we advocate strongly for active child participation and have seen its specific value to an EdTech project. Our student champions played an important role in ensuring the lab timetable was adhered to, helping new arrivals encountering technology for the first time to navigate the project hardware and software, and providing support with preparing and tidying the ICT lab itself.

Whether a student champion can play the de facto enabler role in full is not clear. It would be ambitious to expect a student to monitor student activity (and data) and report back to the class teacher on the same, let alone stand in briefly in the classroom (during lesson time) while the teacher paid an occasional check-in visit to the lab.

Child participation is on a spectrum, however. In iMlango, our student champions were - in the opinion of the project - at level 4 of the recognised UNICEF model: 'Assigned but informed'[8]. An ambitious project might consider how to increase their level of agency and move them higher within the spectrum [see Appendix 1] – at the same time negating the cost implications of appointing an adult in-school enabler.

NOTE:

There are also a number of very important practical considerations for projects to bear in mind when it comes to utilising students in this way, so that the enabler approach is safe for those involved, as well as protective of children's time, right to study and play, and overall well being. For example, it is absolutely imperative that parental consent is obtained beforehand, and that any responsibilities that children undertake are age-appropriate and do not interfere with their studies. Students in lower primary grades should not be considered for the role, and the existing safeguarding arrangements in the schools must be robust. Flnally, the project would also need to risk assess the e-safety aspects of the role before proceeding with the use of learners in this way.

[8] https://www.unicef.ca/sites/default/files/imce_uploads/UTILITY%20NAV/TEACHERS/DOCS/GC/levels_of_child_participation.pdf

FINDING 2.
AN EVOLVING TEACHER TRAINING APPROACH FACILITATES EDTECH ADOPTION

BACKGROUND AND CONTEXT

Teacher training is a fundamental component of most education projects. In a large-scale EdTech implementation like iMlango, levels of teacher engagement will vary, but the relationship between engagement and success is quantifiably stark. Our approach to teacher training was not monolithic – it was course corrective and diverse. It was responsive to needs and circumstances. And it embodied an evolutionary – not linear – process of behavioural change. Its evolution served to gradually strengthen teacher agency around integrating EdTech into their routines, and in doing so curb latent technophobia.

Having an engaged teaching workforce manifested itself in 79% of our 'independent' schools[9]. This is not merely representative of iMlango as a whole. Schools with an engaged teaching workforce appear relatively infrequently in iMlango, according to our study:

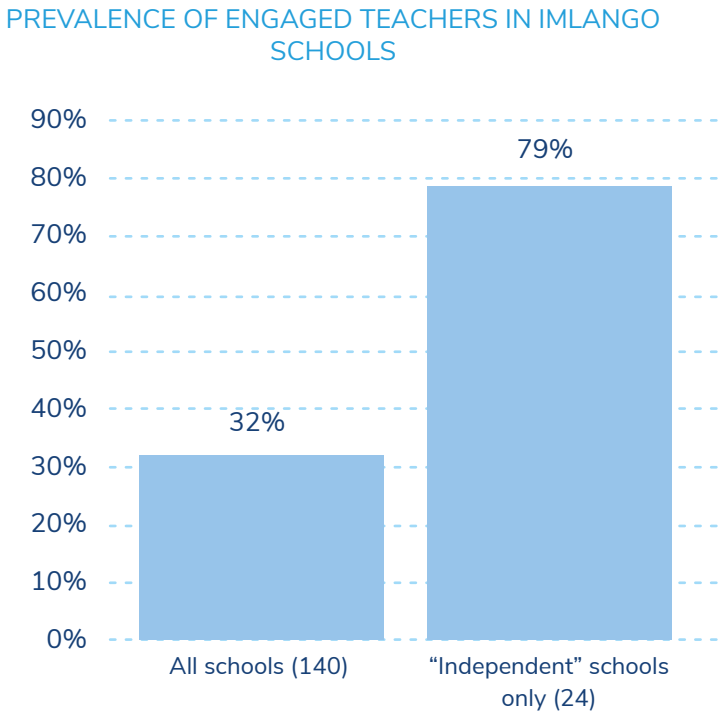


FIGURE II

Having engaged teachers is obviously a critical factor in EdTech adoption: 'non-independent' schools tended not to have engaged teachers. Technological skill is also instrumental. 50% of our 'independent' schools had 'tech-savvy' teachers, a percentage which dwarfs the frequency with which such teachers appear within the general (iMlango) population. Again, 'non-independent' schools tended not to have tech-savvy teachers.

Age is not a determining factor. In 38% of 'independent' schools the workforce was considered to be 'young'. This provides an underwhelming case for inclusion in our success formula, although it is at least higher than the prevalence of young teachers in iMlango schools generally (18%).

[9] *Whether the teaching workforce was 'engaged' or not is based upon subjective field officer assessment of the schools within their portfolio.*

KEY INSIGHTS FOR THE SECTOR:

A) TECHNOPHOBIA – LIKE TEACHER ENGAGEMENT – IS NOT A FIXED STATE.

Tech-literacy was definitely not the main focus of iMlango's teacher training, but it was – on one level – where it all began. In viewing technophobia as a starting point, we illustrate the breadth of behavioural change that needs to be realised in an EdTech project such as this.

According to Whizz Education Field Officers, a range of barriers prevented iMlango teachers from engaging with technology. Many had never embraced technology and asked: 'how can I be comfortable bringing children to the lab, when I cannot answer their questions about technology?' They feared having students in the lab and the 'loss of control' which they assumed would ensue. There was a belief among some teachers that in order to integrate ICT into learning, they needed to 'know everything about ICT', and certainly more than the students. This created an insurmountable barrier.

In addition, technophobic teachers had a misconception that the use of ICT in teaching increases workload. iMlango felt like 'too much for them to take on board'[10] (which in turn increased their reliance on Field Officers, mentioned above).

But there were examples of non-'tech-savvy' teachers developing, little-by-little, the requisite skills and confidence during the project lifespan. One teacher gradually increased his confidence with technology and began to feel the value and benefit of integrating ICT into learning. He realised it was not as complicated as assumed. His school changed – from low engaging to high engaging. Another was initially afraid of the ICT lab. Now, she is confident with both troubleshooting issues and interpreting Maths-Whizz learning data. She wishes she had started learning about ICT earlier.

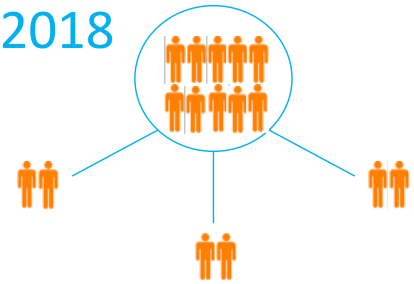
B) THE EVOLUTION OF OUR TEACHER TRAINING JOURNEY IS INSTRUCTIVE AS A MODEL FOR EDTECH PROJECTS IN LOW RESOURCE SETTINGS.

Our evolving approach to (numeracy) teacher training in iMlango can be summarised in the image below (see figure iii). The evolution was mostly planned, but it transpired partly as a response to circumstances. The model is readily rationalised however, and fully aligns with both the project aims and our beliefs about EdTech, capacity building and behaviour change.

Our teacher training approach landed ultimately on a wholly online delivery approach in which technological aptitude was fully intertwined with maths-specific pedagogical content. But we could not have started with such an overwhelming model – rather, we needed to scaffold and evolve to get there. This evolution is described in detail in the diagram below and the narrative that follows.

[10] *Contextual factors played a part too. Teachers nearing retirement age did not feel that they needed to learn about ICT. They did not want to understand how technology can be used to drive learning outcomes. Furthermore, when iMlango was being introduced, teachers nationally had developed some resistance to ICT integration. They felt that salaries and teacher numbers should be increased, rather than tablets be purchased for schools.*

2018



Centralised 'champion' training model

- 1 event per county, April 2018
- 4 days' duration
- Delivered by non-specialist Field Officers
- 410 'champions' trained (2 per school)

Training content

- Basic ICT
- How to deploy the literacy and numeracy project resources
- How to train your colleagues (ToT / adult learning principles)

Leading to cascading of ICT learning to all schools by the trained 'champions' throughout 2018.

2019

Blended training model

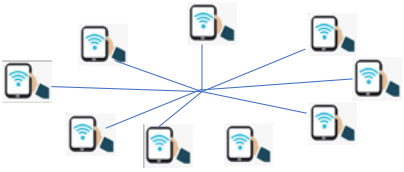
- 1 event per school, Jan – Mar 2019
- 2 days' duration
- Video content delivered by Education Advisors
- Activities facilitated f2f by Field Officers
- All maths and English teachers trained

Training content

- How to deliver effective whole-class learning (using the project's ICT resources)
- How to use project data to inform teaching & learning

Leading to regular subject panel workshops and interactions, model lesson delivery and teacher lesson observations with coached feedback throughout 2019.

2020/21



Online training model

- Hosted on Moodle - all schools given access
- Training modules produced (and submissions assessed) by Education specialist
- Teacher progress supported by Field Officers

Training content

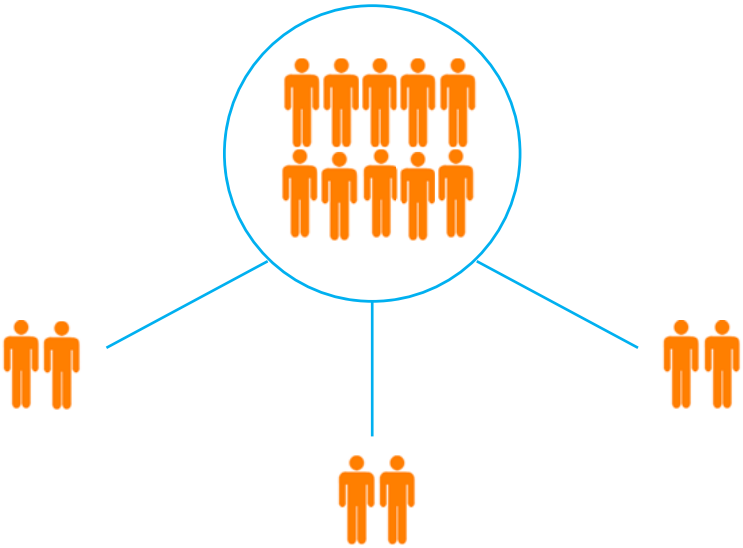
- The Educational benefits of using ICTs
- Pedagogy and Collaborative learning using ICT
- Questioning using ICT
- Teacher Modelling using ICT
- Mathematical talk using ICT
- Submission of final assessment (mock lesson plan)

Alongside installation of offline animated maths content + onboarding of teachers in each school around how to effectively deploy it.

FIGURE III [11]

[11] *The summary image above does not include the initial 2016 (GEC1) training, from which the notion of a 'champions' model was generated. The 2016 training brought teachers to a central location, but selection issues and less joined-up content meant that its impact was limited. The key learning from it was the need to strategically select key individuals that could represent the project within their school community.*

2018 - CENTRALISED 'CHAMPIONS' TRAINING MODEL



In April 2018 we elected to conduct a mass centralised training for teachers. This model was chosen to ensure that accurate, comprehensive messaging about project activities was imparted and embedded through a single high-quality intervention that would kickstart iMlango-2. We calculated that four-day long school-by-school trainings would be too time-consuming to execute, thereby delaying essential learning activities from starting properly across the board.

The training brought two 'champions' from each iMlango school together to be trained by (non-specialist) iMlango field staff in a central location in each county. The main focus of the training was (i) How to deploy the literacy and numeracy project resources – and this substantive content was bookended by two shorter (day-long) sessions on (ii) Basic ICT and (iii) Training of Trainers (i.e. 'How to train your colleagues'). The stated expectation was that upon their return to school, 'champions' would cascade the knowledge from (i) and (ii) to their teacher colleagues using the new skills gained in (iii) - then continue supporting those same colleagues on a day-to-day basis.

INSIGHTS AND REFLECTIONS:

- A four-day centralised training is expensive to run because accommodation, food and travel need to be budgeted for. However, it enabled us to cover the content we wanted efficiently and in depth. Bringing teachers together in clusters also enabled cross-pollination of ideas and fostered a collaborative 'team' spirit, which was useful for the early months of a project. Participant feedback was very positive, and we observed favourable usage trends following completion of the training.
- We know that cascade models run the risk of dilution unless quality can be controlled. We attempted to mitigate this through inclusion of the session on Adult Learning Principles, although the actual onward training delivery by champions was largely outside our sphere of control. In fact, the cascading was mostly successful for onward dissemination of the Basic ICT content. Champions were able to drip-feed this learning adequately to their colleagues. The literacy and numeracy content was not cascaded so effectively, largely due to its greater complexity and the champions' lack of confidence in 'teaching' it. On reflection, the cascade model should have focused on ICT skills only, with literacy and numeracy content delivery the responsibility of the project teams.
- Content was deliberately more functional than educational due to the stage of the project, the composition of the facilitation team and the basic skill and knowledge gaps identified. However, this balance could have been slightly better refined. The ICT training element was pitched at the right level, but arguably would have been better integrated into the sessions on literacy and numeracy, rather than standing alone from them. And it was notable that the training on adult learning principles (i.e. Training of Trainers) was very well received – possibly due to its general pedagogical focus, which made up for the deficit of pedagogical content elsewhere.
- The 'champions' approach succeeded on a number of levels, but it had a definite shelf-life. Having knowledge 'owned' by a minority of stakeholders led to other teachers feeling side-lined from the project. Over the ensuing months, anything iMlango-related came to be seen as belonging to the 'champions', rather than to the whole school. As a consequence, ICT exposure was minimal for many teachers. Champions were empowered, but the overreliance on them to perform lab duties meant that technophobia was not eradicated from the project in full.

2019 – BLENDED IN-SCHOOL TRAINING MODEL

By 2019, we wanted to make the focus of our teacher training more educational, both as the logical next phase in the unfolding project, and in recognition of acute observed needs. We simultaneously needed to move away from the 'champions' model of support to a more inclusive, whole-school approach. Having only two Education Advisors (EAs) in place across the project was a significant constraint. To mitigate this, we leveraged the existing iMlango infrastructure to deliver a hybrid (part-tech, part-face-to-face) training modality which 'beamed' expert EA video inputs into each school. Follow-up discussions and activities related to the specialist content were facilitated by a (non-expert) Field Officer in situ.

This model enabled us to widen participation in every school and to increase focus on teacher quality. We did so over a two-and-a-half month period, directly training all maths and English teachers in the project. The sessions were participatory and the content pedagogical, covering (i) How to deliver effective whole-class learning (using the project's ICT resources), and (ii) How to use project data to inform teaching & learning.

The training design directly reinvigorated dormant subject panels, and stimulated the subsequent facilitation through them (by project staff) of educational workshops, implementation planning, model and peer-taught lessons, and teacher observations with coached feedback.

INSIGHTS AND REFLECTIONS:

- Refocusing on all teachers rather than only champions changed a lot of perceptions about ICT. The whole-school approach helped overcome the fear of technology. Reinvigorated maths panels led to increased teacher confidence. Elderly, previously technophobic teachers began to take their students to the lab regularly, sometimes achieving the highest Maths-Whizz usage in the school. Fear of failure was present among teachers initially: very few would volunteer to demo lessons using the projector, not wanting to lose face in front of colleagues, let alone children. But once they began to see the subject panel meetings as a safe space, they got involved and began to develop their skills and confidence.
- This evolution simultaneously ushered in an increased sense of teacher agency. Changing to a holistic in-school support approach coincided with more teachers becoming interested in delivering learning through ICT, realising how to integrate resources into their teaching without increasing workload, and gaining confidence in doing so through observations and coaching. They began to proactively conduct their own lessons using projectors and whole-class iMlango resources. The training introduced a project observation tool which reinforced teacher agency. The tool was user friendly, and non-judgmental. Lesson observations became a normalised part of subject panel business, and teachers even used the tool themselves to conduct peer observations.
- Form and content became more aligned within this training modality. Technology was the principal delivery mechanism, but was also infused within the theoretical and practical content. Pedagogical good practices were taught (via video), then actively deployed by participants using technology. In fact, greater project cohesiveness ensued generally. Data-led capacity building became a product of the training intervention. In addition to the rich Maths-Whizz topic analytics we collected as a matter of course, we now had access to lesson observation data as well and were therefore able to establish a coherent, self-reinforcing system for addressing teachers' subject and pedagogical needs throughout 2019 [see Appendix 2]. In addition, the resurrection of subject panels enabled us to conduct detailed implementation planning sessions which specifically aligned project activities with each school's stated vision for success.
- There was an impact on our overall learning data in 2019. Where previously we noted that training had contributed to increased usage, now we could see a tangible impact on learning efficacy (Figure iv), and the early signs of effectiveness, i.e. learning at scale (Figure v). We also observed teachers shifting their classroom practice and leveraging Maths-Whizz to improve their own instruction. (The impact on reducing teacher workload is not so clearly established from our observations).

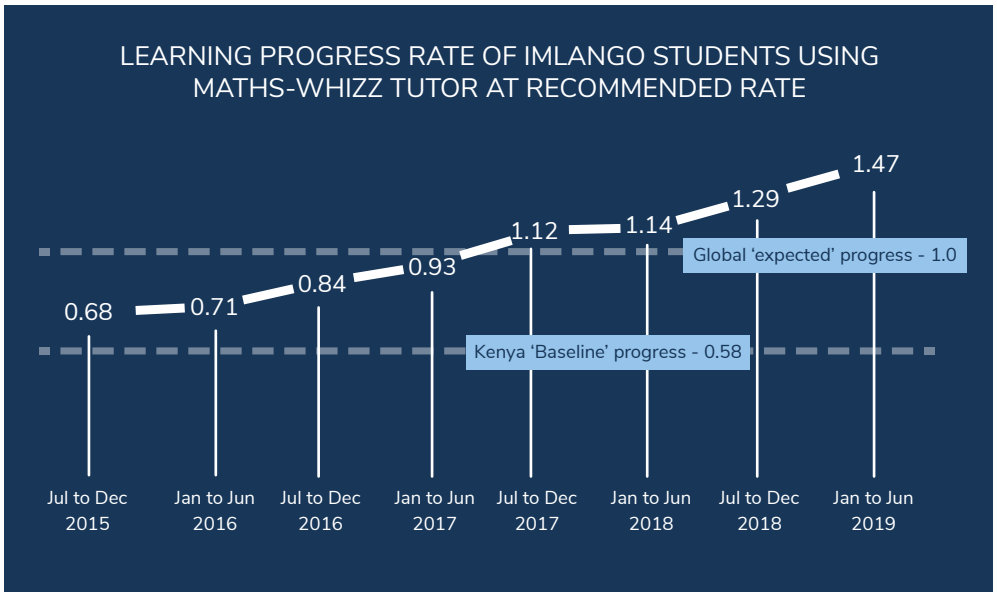
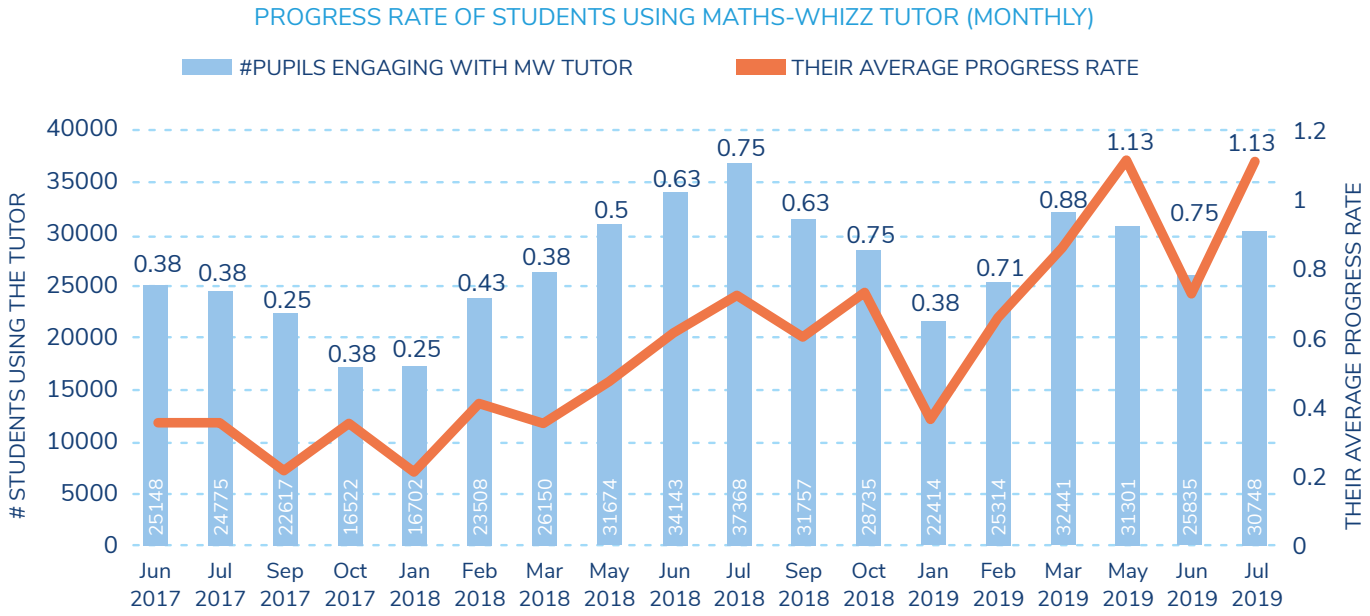


FIGURE IV – LEARNING PROGRESS RATES ON MATHS-WHIZZ MORE THAN DOUBLE SINCE THE START OF THE PROJECT[12]



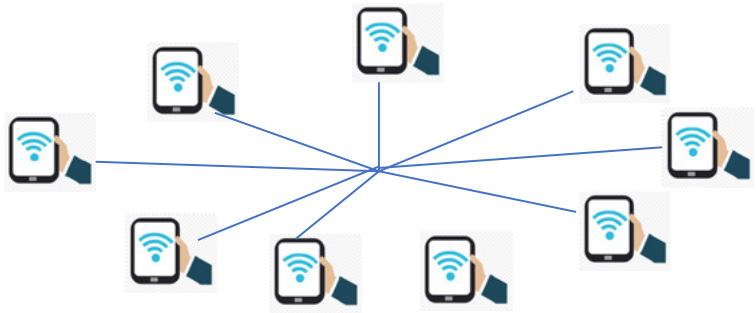
NB>0.58=ABOVE IMALANGO KENYAN BASELINE PROGRESS RATE. >1.0=ACCELERATED LEARNING INTERNATIONALLY-SPEAKING

FIGURE V – 30,000+ STUDENTS ACHIEVED ACCELERATED LEARNING (ON AVERAGE) IN MAY AND JULY 2019[13]

[12] *Our Maths-Whizz data from mid-2017 onwards shows that students using the virtual tutor for the recommended amount of time (i.e. 30-90 minutes per week) exhibited accelerated learning. If sustained, their Maths Ages would increase by more than 1 year in a 1-year period. This was not the case at the start of the project (2015 - 17), which proves that learning efficacy improved over time.*

[13] *The numbers of students engaging with the Maths-Whizz virtual tutor (for more than 0 minutes) increased over time, albeit with some seasonal dips. More interestingly, the average progress rate for those students also increased (for e.g. compare July 2018 progress rate - 0.75 - with July 2019 - 1.13), meaning students used the tutor more and more efficiently (i.e. spending less time to achieve a learning objective) as the project unfolded.*

2020/21 – ONLINE TRAINING MODEL



In late 2019 we began developing an online 'Classroom Instruction for Maths Teachers' course. This would form our 2020 teacher training offer. It was now time to go deeper and more granular, albeit at scale and without sacrificing quality. Where previous trainings had covered literacy and numeracy, in 2020 we wanted to build on the work done with maths panels the previous year and equip them with subject-specific pedagogical skills. Recognising that the project end was nearing, we also wanted to shift agency further onto the teachers and encourage a degree of autonomous, self-paced professional development. A bespoke, online course guaranteed the consistency of the educational content delivery (something which eluded us to an extent in 2019) and enabled all iMlango maths teachers to simultaneously access it.

Internal maths specialists designed the Moodle-hosted course. Its 40 learning hours introduced (i) The educational benefits of using ICTs in teaching and learning; before drilling down into (ii) Pedagogy and collaborative learning (using ICTs), (iii) Questioning, (iv) Teacher modelling and (v) Mathematical talk. A summative marked assessment – a plan for a lesson delivered using Maths-Whizz Teachers' Resource – concluded the course.

Field Officers supported teachers' progress, proactively reaching out to assist with set-up and navigation and to coach them through end of module reflection questions. Alongside the course, we developed offline animated Maths-Whizz whole-class content and installed it into each school as part of our sustainability strategy. This meant that teachers could use the directly relevant skills and knowledge gained from the course to deliver effective learning through ICT post-iMlango.

INSIGHTS AND REFLECTIONS:

- Online teacher training can work in low resource contexts and promotes sustainability. Although COVID was a monumental disrupter, we still managed to graduate over 124 teachers from 84 schools, all of whom demonstrated the necessary competence to deliver effective whole-class lessons using ICT. This totals approximately 4,960 hours of adult learning. Perhaps the real lesson is that online teacher training can work in a pandemic as well. Our course targets had to be re-evaluated but were not abandoned, and progress continued to be made throughout 2020 - even though teachers were dispersed and were not obligated to attend to their professional development. Participants proceeded as individuals, rather than in panels as originally envisaged, but this in itself helped to develop autonomy and confidence (in integrating ICT into learning). Navigating an online course on a smartphone is challenging – especially with the additional curveballs presented by COVID in rural Kenya. Graduating therefore required resilience and proactivity. This calls back to the dynamic discussed earlier. Increased teacher agency and proactivity enables a project to disengage ethically because ownership has transferred to the teachers. When offline learning resources, skills and knowledge have been simultaneously embedded within each school, then outcomes are even more likely to be sustained.
- Human interaction still played an important role even though the course was wholly online. Making weekly personal calls and sending text reminders to direct teachers to specific parts of the course helped them make progress. During the COVID lockdown period, Field Officers also arranged group Zoom sessions to capture common challenges and share updates. They acknowledged small degrees of progress and celebrated success by issuing and sharing certificates. This encouraged teachers to carry on going, even though the long period of school closure was leading to fatigue and waning interest. Having completed the course themselves (and been trained on the GROW[14] model), Field Officers were also able to coach individuals through some of the content, helping them to reflect on what they had learned and unlock answers to the structured reflection questions within themselves. The project's WhatsApp groups were used during COVID to maintain and normalise conversations around teaching and learning maths. In future, these could be further leveraged to create a Community of Practice in which course graduates buddy up with and mentor colleagues that are still making their way through it.

[14] See Whitmore, John. *Coaching for Performance: GROWing Human Potential and Purpose: The Principles and Practice of Coaching and Leadership*

- Design is absolutely key. Without the luxury of charismatic in-person delivery there is far more onus on content and format to drive home the learning. Our training content was directly relevant to and aligned with what the participants teach (i.e., maths lessons within the Kenyan curriculum). Scaffolding was provided which was appropriate to teacher experiences. Concrete examples and activity instructions reinforced specific teaching skills, while practical examples, guides and templates were also supplied. A carefully planned sequence of activities helped to ensure teachers had the prior knowledge that they needed to master new teaching skills.
- Aligning the course with relevant incentives was similarly beneficial – for example providing certificates that might influence individual teachers' career trajectories. Course design should also be cognisant of what the MoE wants from teachers – in our case, the integration of ICT into learning. Finally, having discussions with teachers beforehand can inform design principles – through understanding what their jobs are like on a day-to-day basis, and what the current barriers to improved classroom instruction are.
- In this iteration of our training evolution, form was married to content. Teachers used ICT to develop their skills in delivering learning through ICT. The medium became the message, meaning greater efficiency of implementation. But we evolved to get to this point. It would have been utterly inappropriate to introduce an online course in 2018 while basic ICT needs were unmet. Or in 2019, when teacher agency still needed to be cultivated across the whole school. It is possible that in future projects, the pace of evolution could be hastened, though the temptation to forego some of the steps should be avoided. We know course correction has a transformational impact within EdTech implementations. It is perfectly appropriate that teacher training adapts similarly over a project lifecycle.

The vignette below summarises this journey:

Recently, an iMlango teacher completed the online Classroom Instruction course. When the project began, he was lacking in confidence around ICT. He was not selected as a champion and so did not take part directly in the centralised 2018 training. During 2019 he became involved in subject panel meetings, but still had some reservations about being observed delivering an ICT-based lesson. The local Field Officer modelled a lesson in front of him, then co-taught one with him in front of panel members. His confidence slowly increased. Now he has graduated from our comprehensive online professional development course using his smartphone, and can continue to put these skills into practice using the newly-installed offline animated maths content.

FINDING 3.
DEFINING THE DIMENSIONS OF EFFECTIVE EDTECH LEADERSHIP

BACKGROUND AND CONTEXT

There is a plethora of research around effective school leadership. Our analysis – unsurprisingly – showed that schools which used Maths-Whizz consistently (i.e. our 'independent' schools) tended to have supportive or proactive leaders in place. We regarded this as too simplistic a finding in the March 2020 Field Report. Our updated observations now provide a level of nuance and definition around what EdTech school leadership should look like.

75% of our 'independent' schools had a supportive school leadership in place. This contrasts with only 45% of the iMlango school population at large, suggesting that the frequency is remarkable, not merely representative of the population as a whole.

PREVALENCE OF SUPPORTIVE LEADERSHIP IN IMLANGO SCHOOLS

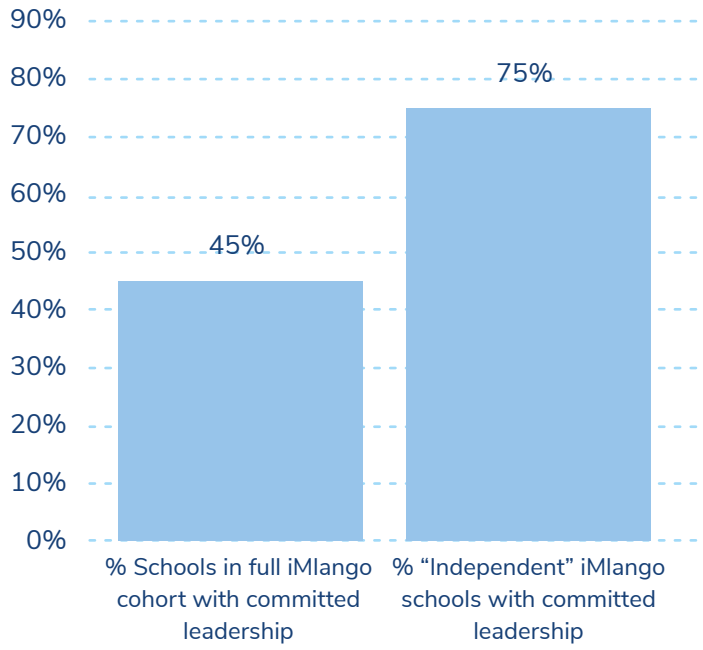


FIGURE VI

There is a correlation, then, between supportive leadership and consistent Maths-Whizz Usage. Supportive leadership occurs far more frequently in our 'independent' schools than it does in iMlango as a whole.

Strong leadership was not absent in the 'non-independent' iMlango schools. In fact, 45 of the 116 'non-independent' schools appear to have strong or supportive leadership in place. It follows that a) this factor alone is insufficiently instrumental; and that b) the type of leadership on display in the 'independent' schools may be significant.

KEY INSIGHTS FOR THE SECTOR:

A) LEADERS IN OUR 'INDEPENDENT' SCHOOLS WERE EMPOWERING RISK-TAKERS. THEIR ACTIONS FACILITATE SUSTAINABILITY.

A common behavioural trait among these school leaders was their willingness to delegate and trust colleagues with responsibility for the ICT lab, or sometimes even the wider ICT strategy. An empowering Head would give the ICT teacher or lead full authority to run the lab freely. These individuals were 'encouraged to take initiative' and knew that there was support from the leadership for any decisions they made.

This approach carried a certain amount of risk for the Head Teacher. As well as ceding control of ICT to the designated individual, they sometimes reduced their classroom timetable as well, potentially impacting quality elsewhere within the school. The risk paid off. Being given full responsibility encouraged individuals to take on the challenge, and the results were evident in terms of Maths-Whizz usage and subsequent learning gains.

Such a seemingly hands-off approach was usually accompanied by clear expectations. It was a two-way street. Resources and trust were provided to the ICT leads, but in return they were accountable to clearly defined deliverables.

As noted in part 1, the presence of designated enablers in a school was critical to success. The most impactful Head Teacher behaviour was to empower an in-school enabler – an activity which disrupted any dynamic of reliance within the project. Sustainability was therefore baked into these leaders' thinking. They understood – subconsciously or not – that to engage with the project effectively was to already set in motion the processes of autonomy and ownership. For donors and project designers, the learning here is to engage school leaders in sustainability discussions right from the point of inception – because the benefits of doing so are felt not only after, but during the project lifespan.

B) OUR 'INDEPENDENT' SCHOOL LEADERS LED FROM THE FRONT.

Another common trait within our successful schools was that the leaders led by example and were 'personally involved' in day-to-day school business. This might manifest itself in going class by class, taking attendance, or in supervising the ICT lab in person. These Head Teachers were directly involved in making things work. Some engaged deeply with the Maths-Whizz learning data and used this as a tool to hold teachers to account, following up with individuals whose classes exhibited low usage, for example.

Leading from the front motivated others and raised the profile of the project. In one school, the Head displayed what a Field Officer described as 'servant leadership'. He had two scheduled sessions each week in the ICT lab and personally monitored them. This helped out the ICT lead (a Board of Management volunteer) in terms of workload, as well as the project Field Officer, who consequently found the school easy to serve.

This characteristic appears to contradict finding a) above, though the two are not mutually exclusive. Far from being hands-off, these leaders threw themselves into the project activities. The challenge for donors and project designers is how to inculcate such behaviour at scale. The similarity with point a) is in the emergence of an individual – either the Head, or a delegated individual – who reduces dependency on project officer presence or input.

This trait sometimes aligned with Head Teachers that were passionate about ICT. In one 'independent' school, the 'transformational' Head Teacher embraced technology in full, encouraging all teachers to maintain soft copies of all their marking records. He also connected additional office PCs to the project wifi, demonstrating his commitment to ICT even outside of the project. In contrast, some older Head Teachers tended not to be so interested or au fait with ICT and as a result the lab was not looked after.

C) BIG PICTURE THINKING IS AN EDTECH SCHOOL LEADERSHIP TRAIT

Our 'independent' school leaders tended to be very focused on learning and the bigger picture, 'rather than on KCPE exam results' alone. In these schools, the leaders could clearly articulate the vision and sense of purpose of the school beyond meeting high-stakes testing targets. They 'understood the direction in which their school needed to go'. This enabled them to make decisions with intangible medium-long term benefits, such as enabling children to learn on computers because it will enhance their secondary school careers and improve their job prospects in later life.

These Head Teachers also had a genuine passion for the children and an active interest in their work. They understood the power of education to lift their students from poverty and saw iMlango as a rare opportunity to expedite this.

Such an intrinsic, value-driven mindset is difficult to nurture into existence at pace. The challenge for donors and project designers – as above – is how to embed this thinking at large. Routinely and repeatedly framing EdTech conversations with school leaders in terms of outcomes rather than tasks is a minimum requirement. Furthermore, some specific project activities do support the adoption of this mindset. For example, throughout 2019 we developed a detailed implementation plan with each iMlango maths panel. The starting point for this document was the articulation of the school's vision for success for mathematics. SMART[15] targets for their Maths-Whizz implementation which aligned with these long-term success goals were then collaboratively established and recorded within the plan.

D) PROJECT INPUTS CAN SUPPORT AND STIMULATE POSITIVE HEAD TEACHER BEHAVIOUR

In a number of 'independent' schools, the leadership invested in improving the ICT lab infrastructure, for example by purchasing dust blowers, tiling surfaces or buying computer covers. Such actions were partly down to initiative and innovation, but also in many cases stimulated by the project. Our early centralised trainings and engagement lunch events had a material impact: many of these practical lab restoration ideas had been shared here, then enacted in the field in the months that followed. These schools saw success.

The role of the Field Officer was also instrumental in driving positive leadership behaviours. Some Head Teachers were very responsive, taking on board Field Officer advice in full and quickly following through on suggestions made – such as being tough on underperforming teachers (according to the project data) or implementing ICT lab timetables according to our proposed design.

In fact, Field Officers would keep Head Teacher contact details on their phones, sharing data with them via WhatsApp and persistently checking in on progress. The project also conducted leadership training which helped to embed some of these behaviours, in particular around monitoring learning data. These training events also served as forums for sharing good practice between schools and to begin conversations around sustainability.

For donors and project designers this point about stimulating behaviour is useful. It is not possible – or ethical – to deselect worthy schools from a planned intervention based on perceived personality deficits at leadership level. It is possible to stimulate and maximise some positive leadership behaviours through knowledge sharing, capacity building and (evidence-based) persuasion.

This case-study of Bahati Primary further exemplifies some of the key points above.

[15] *Specific, Measurable, Achievable, Relevant, Time-bound*

FINDING 4.

2021 NEEDS AN EDTECH SUCCESS FORMULA FOR LOW RESOURCE SETTINGS

BACKGROUND AND CONTEXT

The world facing education planners in 2021 is utterly changed. Our March 2020 EdTech success formula predated COVID, and therefore invites some suspicion. But the changed world also invites recalibration of educational norms, and so a robust 'manifesto' for EdTech is timely.

We now revise some terms from the original EdTech success formula. Small/ medium school populations are not conclusively instrumental. The frequency with which they appear in our cohort of consistently using 'independent' schools mirrors that of the iMlango population at large. Comparing with the population size of Kenyan schools beyond the project is no more illuminating.

Socioeconomic status is also inconclusive. Reworking the original analysis using a slightly more nuanced deprivation index shows us that 33% of our 'independent' schools were in the 'hardship' category, whereas 54% were classed as 'rural' and 13% 'urban'.

On the whole, the distribution broadly matches that of the wider iMlango population. Furthermore, no one category of school dominates the make-up of the 'independent' cohort [16]. Based on our study, then, socioeconomic status does not appear to be an instrumental factor behind EdTech adoption.

SOCIOECONOMIC STATUS OF THE 24 "INDEPENDENT" IMLANGO SCHOOLS

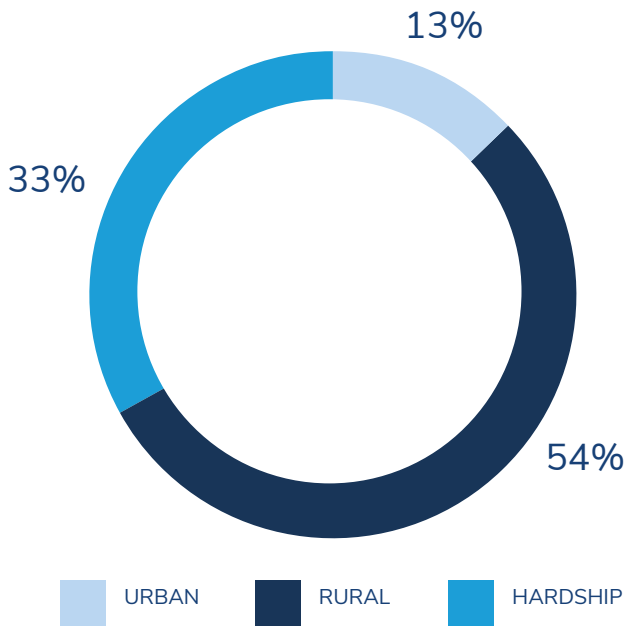


FIGURE VII

[16] *It appears that 'urban' schools appear less frequently within our 'independent' cohort than they do in the population as a whole, suggesting – somewhat counterintuitively – that urban schools are less likely to adopt EdTech. Correspondingly, 'rural' and 'hardship' schools appear more frequently in the 'independent' cohort than they do in the iMlango population at large.*

Disposing of these non-remarkable components and finessing the others, as discussed in the sections above, our EdTech success formula now looks like this:

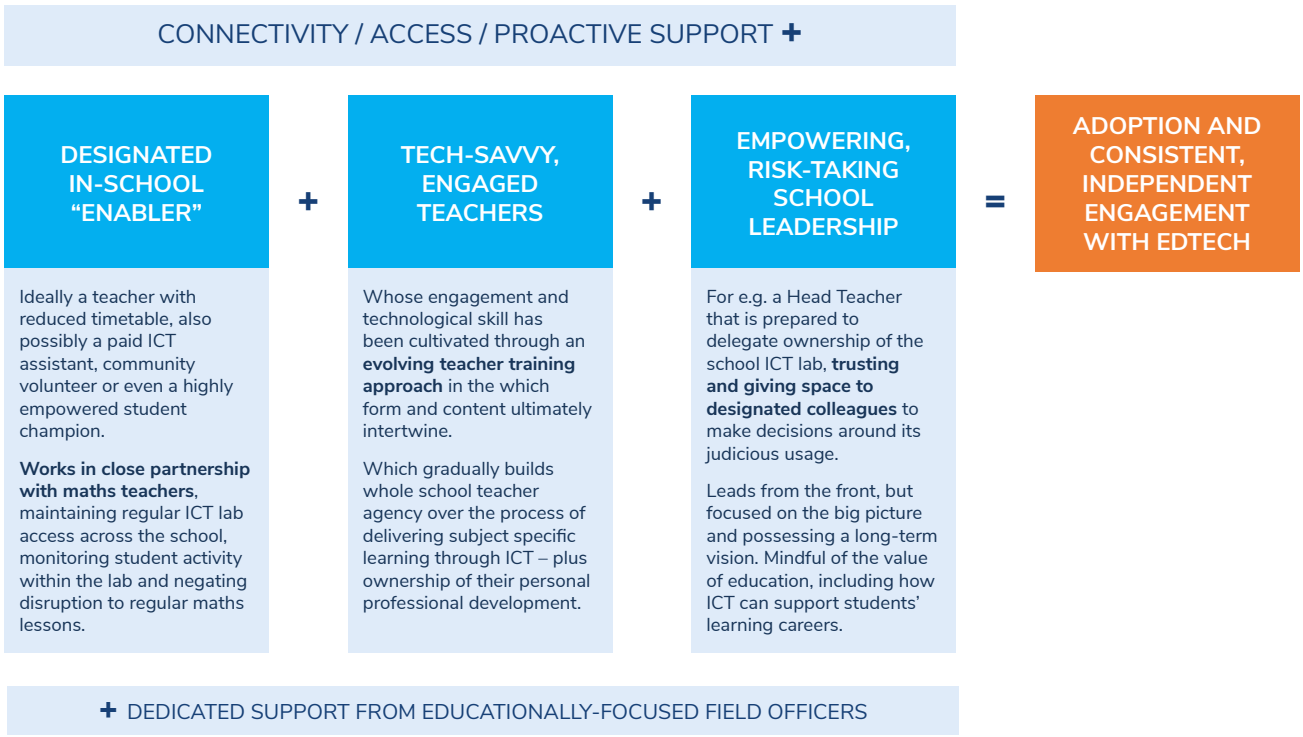


FIGURE VIII[17]

COVID-19 reorients but does not dismantle this asserted paradigm.

[17] *The role of the project field officer has not been discussed in any detail in this paper, yet it is fundamentally important. All iMlango schools received the same level and type of support from field officers, yet not all exhibited consistent usage. The field officer role is in fact a prerequisite for success - much like access and connectivity are - rather than a variable that we were able to isolate. As noted, the role of the field officer diminishes within a successful implementation as project tasks and processes are taken on by the designated enabler and/or the empowered teaching body.*

KEY INSIGHTS FOR THE SECTOR:

A) EDTECH IS AN INTEGRAL PART OF THE CURRENT GLOBAL SOLUTION.

COVID-19 has had a seismic impact upon learning globally. EdTech is a logical part of the solution, including in low resource settings. There are three main ways in which educational technology can be deployed to mitigate the ravages of the pandemic:

- i. The rich learning analytics harvested by default within EdTech platforms can quantify learning loss, including at a granular student or topic-level. Where paper-based assessments carry a heavy administrative burden, or suffer from reliability issues, EdTech represents an efficient, reliable alternative. Easily disaggregated learning loss data better serves central planners who can plug specific resource gaps as part of their recovery effort.
- ii. Some technology-based learning programmes can guarantee acceleration through the curriculum, thereby addressing learning loss accumulated as a result of the pandemic. When used consistently and as recommended, students can recover the COVID deficit within months. And in disadvantaged, low resource settings, sustaining this usage can begin to chip away at the structural poverty-induced learning gap as well. Lessons learned on how to implement and sustain such programmes effectively are therefore vital.
- iii. In the event of future COVID-related shocks, remote learning will again come to the fore globally. While access issues can prevail in countries like Kenya, the importance of maintaining learning routines is unarguable. EdTech in some (possibly reimagined) shape or form will unquestionably be a prominent feature.

B) COVID HAS NOT NECESSARILY IMPACTED OUR EDTECH SUCCESS FORMULA.

The opposite might be assumed. One can imagine that lack of access during the school closure period may have entrenched opposition to (or fear of) technology. Or that there might be a perceived need among Kenyan teachers to revert to traditional methods of instruction to close the learning loss gap. Although our observations are limited, such assumptions are not borne out.

We do note that classes in Kenyan schools are now divided into additional streams, meaning teachers have more lessons to teach. This affects the ICT lab timetable in general, restricting access as new class slots need to be accommodated. In some schools, the ICT lab was also seen as a forum for passing on infection, further limiting entry. The role of the designated enabler is arguably more important in these circumstances: keeping the lab open despite the elevated logistical challenges. Meanwhile, delivery of whole-class maths learning through ICT should be unaffected by COVID. Indeed, deploying pre-assembled animated maths lessons (which are aligned to the curriculum) can help teachers to manage their newly increased workload.

When schools reopened post-COVID our field team did not see a negative change in attitude towards ICT. In-lab Maths-Whizz reassessments were able to be conducted as scheduled. It's true that labs had been neglected during 2020, which was disappointing yet inevitable. But because of COVID, we also found that some teachers appreciate technology anew. They see that it is possible for learning to happen remotely. Sharing pdf worksheets with them during school closures demonstrated the value of EdTech, albeit with some penetration challenges. Through onward cascading, teachers were able to maintain educational contact with students from afar – a concept they had not entertained previously.

Generally, teachers appear more aware about how technology can benefit their students. Over and above iMlango, and indeed COVID, they recognise that there is value in technology. The wider truth is that Kenya is now engaged with the Competency Based Curriculum – and this in itself demands the use of ICT. Those iMlango teachers that have embraced technology over the course of the project will be able to cope well with this new framework.

C) COVID IN FACT VALIDATES OUR TEACHER TRAINING APPROACH.

As mentioned, the pandemic has given us an opportunity to reset the educational status quo. Through our evolved, online training approach we were able to address latent teacher quality deficiencies while schools were closed, thereby building back better. Teachers typically have more access to technology than students in our marginalised communities. Since remote student learning was difficult to maintain, we concentrated our response energies on connecting teachers to the Moodle-hosted professional development course via their smartphones. In doing so, we equipped them with the pedagogical skills and knowledge that would - in theory - enable them to deliver higher quality maths lessons at the point of school reopening, thereby addressing some of the lost learning.

With this approach we simultaneously developed some structural resilience. Navigating and progressing through a wholly online course implicitly enhanced the teachers' technological aptitude, thereby better preparing them for a future blended learning normality. Even in low resource settings with access challenges, this has value. A more technologically skilled teacher can better leverage low tech solutions – such as WhatsApp – to send, receive and cascade pdf worksheets to parents and communities, even establishing feedback loops (as some iMlango teachers did) to mark students' attempts at completing them.

D) A GLOBALLY RELEVANT UNIFYING THREAD.

Although some appear to be more instrumental than others, it is the application of our success factors in concert, rather than the presence of individual factors in isolation, that leads to EdTech adoption. 'Non-independent' schools in iMlango frequently exhibited one or more characteristic without achieving consistent usage.

The unifying thread within them all is agency. Designated in-school enablers necessarily reduce reliance on project input and visibility, breaking the dependency dynamic. An evolving, structured teacher training approach builds confidence around using technology to deliver learning and increases teachers' ownership of their professional development. A risk-taking Head Teacher empowers her staff, giving them control over the ICT lab and its operations. On one level this formulation is intuitive. Increased agency within the school reduces dependence on external players. An 'independent' school uses Maths-Whizz consistently, not only when the project staff pay a visit.

In a shared education emergency, we can learn from other, dissimilar contexts. Just as high-income contexts should factor well-established humanitarian principles and protocols into their COVID recovery plans, so we can look to EdTech implementation globally to test the assertions in this paper. A cautionary experience in other (sales-based) contexts where Whizz Education operates is insightful. Far from relying on project presence, like in iMlango, some schools go the opposite way, viewing companies merely as EdTech product providers, not partners, and deliberately disengaging from offers of educational support. Initially, this appears to refute our claims about dependency. These schools achieve independence immediately. But their implementation does not flourish. Autonomy is achieved, but it is a narrow, unsustainable autonomy. The formative educational partnering inputs which catalyse success have been skipped.

This example underscores the spirit of evolution, referenced throughout this paper. Independence and agency is the desired end state, whatever the territory. But it is not an asymmetric, 'at all costs' pursuit. Although it can be shortened - based on lessons learned - the process of achieving agency should not be rushed nor the steps within it bypassed. It is through the evolving, supported journey to get there that value and quality is derived.

EDDIE RALSTON, HEAD OF GLOBAL IMPLEMENTATION,
WHIZZ EDUCATION

Macmillan House
Platform 1, Paddington Station
London, W2 1FT
United Kingdom

support@whizz.com

tel:+44 (0) 203 328 6564

The iMlango project is supported by the UK Foreign Commonwealth and Development Office (FCDO) through the Girls' Education Challenge. The contents are the sole responsibility of the authors and do not necessarily reflect the views of FCDO.

APPENDICES

APPENDIX 1, UNICEF - LEVELS OF CHILD PARTICIPATION

8 CHILD-INITIATED, SHARED DECISIONS WITH ADULTS

- Children initiate projects themselves, while the decision-making is shared with adults. Children have the power to make positive changes based upon their own views and ideas, while drawing upon the expertise and assistance of adults. Adults do not impose their views or try to direct the project: rather they listen, observe and act as sounding boards for the ideas and plans of young people.

7 CHILD-INITIATED AND DIRECTED

- Children initiate and direct the project themselves, with adults playing only a supportive role. Adults provide children with the tools, resources, and information they need to bring the views and ideas into fruition, but the decision-making happens solely among the children.

6 ADULT-INITIATED, SHARED DECISIONS WITH CHILDREN

- Adults initiate actions but share decision-making powers with children. While the initial idea might come from adults, children are involved with the planning, design and implementation of a particular project.

5 CONSULTED AND INFORMED

- Children give advice on projects that are run by adults. Children are not involved in the decision-making, but are asked to share ideas that will inform the decisions of adults. Children need to be informed about how their advice will be used and made aware of the outcomes of decisions made by adults.

4 ASSIGNED BUT INFORMED

- Children are assigned a specific role in a project by adults. Children understand the intentions of the project and who made the decisions concerning their involvement and why. Children are given a meaningful role, for which they volunteer only after they have a clear understanding of the objectives.

3 TOKENISM (INEFFECTIVE PARTICIPATION)

- Children are asked to speak or participate in a project run by adults without fully understanding the issues, the rationale behind the project or what their contribution adds to the project. They appear to be given a voice, but in reality they have few choices for how to participate. For example, children might be asked to sit on a panel with no explanation as to how the were selected and with little time to prepare.

2 DECORATION (INEFFECTIVE PARTICIPATION)

- Children are used to bolster a case led by adults by dressing, acting or performing in a certain way. They do not contribute to the organization or planning of the event, rather their participation is used mainly to elicit an emotional response from specific stakeholders or audiences.

1 MANIPULATION (INEFFECTIVE PARTICIPATION)

- Adults use children to promote a cause and present that the cause is inspired or supported by children, while they have no understanding of the cause. If the children have no understanding of the issues or how their actions can contribute, their participation can be viewed as manipulation.

https://www.unicef.ca/sites/default/files/imce_uploads/UTILITY%20NAV/TEACHERS/DOCS/GC/levels_of_child_participation.pdf

APPENDICES

APPENDIX 2, ADDRESSING IMLANGO TEACHERS' SUBJECT AND PEDAGOGICAL NEEDS THROUGH DATA-LED CAPACITY BUILDING