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POLICY BRIEF

Under the Hood of an EdTech Study in Kenya

Implementation challenges, successes, and lessons learnt

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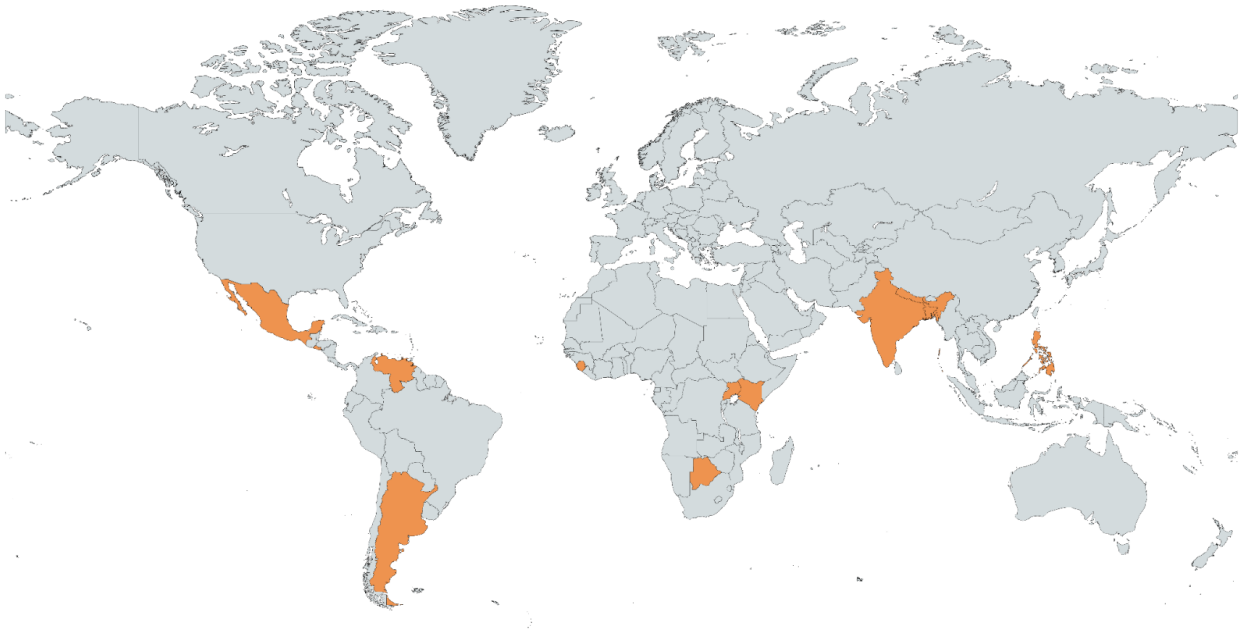
Context and background

In the years following a global pandemic that left 1.6 billion learners out of school (↑UNESCO, 2020), the global learning crisis has grown more urgent. Governments worldwide have sought technology-enabled education platforms that can support higher quality, resilient education systems. This study provides evidence on one solution, basic mobile phones, that present a widely available and cost-effective method for reaching children with distance remedial education support.

Basic mobile phones are an inexpensive and widespread tool that has been shown to improve learning in several contexts. Figure 1 below depicts randomised studies conducted since the 2020 school closures that tested the impact of phone-based tutoring. In many cases, these have been proven to be as effective as higher-tech alternatives, with the latest results showing an average increase of 65% in student ability to perform basic maths operations (↑Angrist et al., 2023b).

These 'low-tech' solutions are particularly appropriate in many countries in the Global South. Kenya, for example, has 98% mobile penetration compared with only 43% internet penetration (↑Kemp, 2020).

Figure 1. *Notable studies on direct phone tutorials since 2020*



As a cheap and easy tool for delivering remote educational support, basic mobile phones represent a potentially cost-effective and remote platform for adapting a range of proven pedagogical methods. Targeted

instructional approaches are one such example that may translate effectively over the phone. These have been shown to work when delivered by teachers or volunteers (↑Banerjee et al., 2007; ↑Banerjee et al., 2010; ↑Banerjee et al., 2017; ↑Duflo et al., 2020) and when using personalised learning software (↑Banerjee et al., 2007; ↑Muralidharan et al., 2019; ↑Büchel et al., 2022).

Programme design and intervention

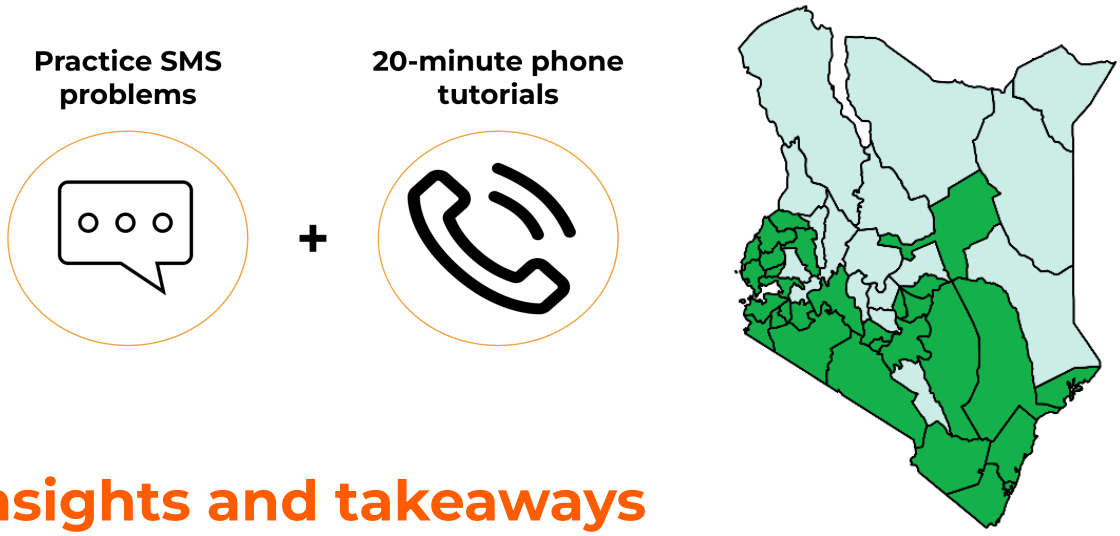
This study builds on a recent research effort conducted in Botswana on targeted instruction via phone-based tutoring approaches at the onset of the Covid-19 pandemic. Results indicated that simple 20-minute targeted phone tutorials coupled with practice maths problems sent through SMS could reduce cases of innumeracy by up to 31% (↑Angrist et al., 2020). The intervention was inexpensive, costing between USD 5 and USD 19 per child, and has been cited as a cost-effective intervention to improve learning (↑Akyeampong et al., 2023).

This study tests aspects of remote tutoring that may be specially optimised when delivered through mobile phones, such as methods for individually targeting instruction for students based on their week-to-week educational performance. Further, the evidence produced here tests implementation within a school context where students receive regular classroom instruction. It was designed as a randomised controlled trial (RCT) and implemented in partnership with the organisation NewGlobe[1]. Regular lessons in NewGlobe primary schools are delivered by teachers with less formal education but equipped with detailed lesson guides on tablets (↑Gray-Lobe et al., 2022).

Almost 300 classes between second and fourth grade from 110 primary schools spread across 30 Kenyan counties participated in the RCT, practically encompassing all schools in NewGlobe's school network. A random subset of classes in the experimental sample was assigned to a phone-tutoring intervention between April and June 2022. Teachers in the treatment group were trained on how they can refresh concepts in basic numeracy in weekly one-on-one phone calls directed to the weakest performing pupils in each class.

[1] See https://newglobe.education/history/ retrieved 9 October 2023

Figure 2. *Phone tutoring delivery and study sites in Kenya*



Insights and takeaways

The study in Kenya was delivered through a highly structured school system where classes and teachers were randomly assigned to deliver phone tutorials to children. Throughout the process, implementers and researchers collaborated to collect high-frequency monitoring data. Collecting this data proved invaluable, as it revealed key information on implementation fidelity and the degree to which teachers were able to successfully target instruction.

Notably, the monitoring data documents that teachers struggled to consistently follow the assigned pacing protocol, and reached an average targeting accuracy of below 50%. Tutor feedback at the end of the trial also revealed gaps in the tutors' grasp of pacing guidelines: 34% of respondents self-reported that they prioritised teaching a new concept each week instead of pacing calls according to their students' skills.

Regardless, learning data showed that students who received tutoring calls performed better on higher-order maths concepts like word problems and addition with fractions. This suggests that there is potential for phone-based targeted instruction to improve learning — even when targeted imperfectly, though better targeting would likely result in even stronger learning gains.

A cross-study comparison shows that the targeting accuracy in this research was lower than in other similar trials conducted on phone-based tutoring (↕Angrist et al., 2023b). The initial phone-tutoring study conducted during the Covid-19 pandemic in Botswana showed that learning gains were particularly large when instruction was targeted (↕Angrist et al., 2022). Reinforcing this insight, evidence from a study in Sierra Leone that

assessed phone interventions without targeted instructional mechanisms found little improvement in learning (see ↑Crawfurd et al., 2023). An additional study showed that targeted instruction could improve over time, corresponding to larger treatment effects (↑Angrist et al., 2023a).

Implementation guidance

Phone-based tutoring has emerged as an effective complement to traditional schooling and a resilient substitute during times of crises when school is disrupted. Experimental studies conducted across multiple countries and implemented by various implementing organisations have consistently demonstrated its efficacy. By tailoring content to the child's level and ensuring accurate targeting, phone-based tutoring has proven to be a valuable educational tool.

While growing evidence identifies accurate targeting as an essential ingredient to phone-based tutoring, it takes time and refinement to reach high levels of targeting. Accurate targeting requires careful planning, ideally complemented with rapid monitoring systems. A few policy recommendations include the following:

1. Tailored content and targeting

Implement a comprehensive framework that ensures phone-based tutoring content is tailored to the child's level. This involves pre-assessments or weekly checkpoint questions to individually tailor the content based on the child's progress and needs.

2. Monitoring and feedback

Collect ongoing monitoring data. Besides highlighting the value of tailored instruction, this study emphasised the importance and utility of strong monitoring data. Monitoring data does not only help to understand the mechanisms at work; it can enable real-time feedback if adjustments in implementation are required.

3. Utilising Appropriate Infrastructure

Invest in infrastructure to enable rapid dataflows from monitoring systems to tutors and management. This will facilitate quick adjustments and interventions to improve targeting accuracy and overall effectiveness of phone-based tutoring.

Conclusion and next steps

Governments have often overlooked basic phones in favour of higher-tech options to support distance learning at home. Kenya's Policy for ICT in Education and Training calls for information and communications technology (ICT) "to support and enrich their teaching and learning activities," yet only one-quarter of Kenyan students were accessing digital learning during Covid-19-related school closures. Nearly one-quarter of households were not using any remote learning method at all (↑Otieno & Taddese, 2020).

This presents a missed opportunity for education ministries to utilise large ICT budgets to support effective learning. A review of existing ICT policies in Kenya has offered the same conclusion, underscoring an effort for more inclusive, effective, and resilient digital learning opportunities. To this end, our research provides several basic recommendations for policymakers looking for proven tech-enabled solutions in education.

First, basic mobile phones and other low-tech platforms should be considered a low-cost, high-potential entry point for successful ICT rollout in education. These platforms are relatively cheap within the landscape of EdTech solutions, are already widespread, and require low levels of digital literacy in order to be effectively used. These criteria satisfy several policy goals that are featured in Kenya's ICT in Education and Training Policy documents, most notably those related to enhancing inclusive utilisation of ICT in education and promoting ICT penetration in communities across the country (↑Republic of Kenya, 2021).

Second, policymakers should emphasise sound pedagogy as the most critical component of high-value EdTech programmes. Rather than reducing the need for teachers to engage in the latest instructional best practices — like targeted instruction — EdTech platforms should further amplify teaching practices that have been proven to work. This requires that teachers be informed of the benefits of instructional targeting and provided with rigorous training to ensure proper delivery.

Finally, further testing of a wider range of pedagogical approaches for phone-based and other low-tech tutoring support can assist governments in making better-informed decisions on cost-effective options to deliver specific education interventions. To this end, further testing on phone-adapted targeted instruction and other innovations is necessary.

Contact details

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