Leveraging mobile phones for learning

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Mobile phones are a scalable, low-cost platform to improve learning by engaging students, teachers, and parents in hard-to-reach settings.



A young child sits and engages with a phone.

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Résumé

For more about this insight, listen to J-PAL affiliate professor Jenny Aker and J-PAL invited researcher Noam Angrist on VoxDev's Development Economics podcast.

Students, teachers, parents and administrators need to share timely information with one another, but long distances, poor roads, school closures, and busy schedules make this costly and slow. Simple mobile phones offer an opportunity to make connections less costly and more effective.

Unlike other ed-tech options, simple mobile phones are an almost universal technology, reaching over 95 percent of the global population as of 2025[1]. Mobile phones have become more than a simple communication device, increasingly used to support financial services and data collection. However, they remain underused in education despite clear gaps. For example, climate and conflict keep students from going to school—delivering lessons through a family phone could enable learning from home in these settings. In spread-out rural districts, coaching teachers is costly and overwhelming for limited staff members. Mobile phones offer a faster way to share feedback than in-person visits. Finally, parents' work schedules inhibit meetings with concerned

teachers. Communicating via mobile phones could arm busy parents with the information to support their child's learning. This policy insight documents growing evidence of mobile phones' potential to improve education outcomes by enabling targeted reach at low cost.

A review across thirty studies that measured the impact of mobile phone education programs on student learning, teacher behavior, and parental engagement found that light-touch texting programs in low- and middle-income countries were cheap but rarely effective enough on their own to shift outcomes. Texting interventions are most effective when they deliver practical, personalized information and build on top of solid foundations such as reliable data systems and regular parent–student interactions, which tend to be more common in high-income settings. In contrast, more interactive, intensive interventions layered on top of proven education interventions, such as incorporating tutoring via phones or incentivizing teachers with cash in addition to texts, were most effective in low-resource contexts and among remote populations. Since mobile phones are cheap and widely accessible, effective approaches are also highly cost-effective.

Résultats

Mobile phones for student instruction

Phone-based instruction helped students continue learning when they were outside the classroom, [4], [5], [6], [7], [25], [30] especially when instruction was interactive and tailored to students' learning levels and when instructors and learners were available.

Many low-income children and adults lack at-home resources like books, practice problems, or parents with the time and education to tutor them and supervise their homework. Mobile phones help close this gap by bringing instruction to the home in various ways, such as providing short story texts for parents to read to their children [30], or enabling practice for writing, reading, and number recognition with adult learners [4]. Beyond serving as a resource, mobile education can also directly connect students with live instruction.

Sometimes, students and teachers are forced to learn out of the classroom. Over two billion people live in regions where shocks, such as climate events, teacher strikes, conflicts, and diseases, can shut down schools and severely disrupt learning [7], . In response, governments, nonprofits, and international organizations have been piloting new approaches to keep students learning during crises, like remote learning via radio, television, and mobile phones [6], [7], [21], . Mobile phones reached and engaged students in a way that television, radio, online media, computers, and tablets could not: phones were physically in more households, easily transportable in emergencies, charged faster, lasted longer, enabled more active engagement, and did not hold students to strict broadcast schedules[7].

Mobile remote instruction works best when it supports human interaction rather than one-way content delivery. [4], [5], [6], [7], [25], Making content available is not enough—active engagement is needed. While sending lessons through blast texts or recordings alone is enticing because it is cheap, in most settings, these types of one-way interactions are often not enough, as these approaches can be too passive. Learners often need an instructor to create accountability and adapt to their level; at home, when students get stuck and they have no one prompting them to persist or address their questions, even well-designed nudges and content can be ignored. In five countries with school closures, mobile phones supported learning, especially when weekly tutoring calls and SMS messages were offered together. SMS messages alone were only effective where access to learning was particularly low. Students who received a combination of weekly math texts, reminders, and live tutoring calls improved their test scores by 0.30–0.35 standard deviations (SDs), at an average cost of US$11 per child [7], . In a follow-up study in Botswana, sending additional prerecorded WhatsApp video lessons did not add marginal learning. What mattered most was the base model: supplementing text messages with an active live tutoring phone call [5].

Even in the phones-as-a-resource examples mentioned earlier, including an active engagement component was important for getting the most out of the interventions. In the SMS short story example in Zambia, the SMS messages included both short stories and follow-up questions intended to prompt engagement and comprehension. Additionally, pairing SMS with in-person monthly meetings between caregivers and community mobilizers proved to be a cost-effective program. In Niger, simply learning how to use a mobile phone encouraged adults to be more active and engaged users of mobile phones, leading to increases in literacy and numeracy test scores by 0.20– 0.26 SDs, with impacts in the short and long term [3], [4].

Mobile instruction might support education as a complement [9], [22], to schooling as well as a substitute [4], [6], [7]. Interactive mobile phone instruction requires two people to be actively engaged and available on either side of the phone. For example, teachers and parents would need to have the time to call and text effectively when they are working full schedules. In emergency settings, like the Covid-19 pandemic, when schools and offices are closed, teachers, students, and parents are available. Most effective mobile phone instruction programs conducted during nonemergency times targeted adult learners [1], [3], [25], and parents of preschoolers [17], [13], [[31], who had more availability. A recent quasi-experimental study that followed up on five Covid-19 studies showed that remedial tutoring calls were also effective during normal schooling times when schedules tended to be busier, suggesting that brief tutoring interventions can be delivered as a complement, not only as a substitute, to normal schooling[7], . Randomized A/B tests show that the cost-effectiveness of mobile phone instruction as a complement to schooling can be improved by reducing scheduling frictions to lower costs and engaging caregivers to maximize impact[5].

Of note, for most populations, mobile phones should build on—not replace—in-school instruction. This builds on a broader ed-tech literature showing the importance of using technology to complement teachers, not displace them[9], [22], . For example, replacing textbooks with laptops produced no detectable improvement in learning [8], , while replacing in-person teachers with video-conferenced teachers improved some learning but at a high cost [23].

Mobile phones to change teacher behavior and improve education monitoring systems

When schools used mobile phones to monitor teachers' attendance, teachers showed up to school more [14], [27] and sometimes students learned more. It also reduced overall monitoring costs. Teacher absenteeism is a major barrier to learning in many low- and middle-income countries. However, sending a monitor to track teachers' attendance and effort is expensive and logistically challenging for education systems with limited infrastructure and weak institutions. Incorporating texts or calls on top of other monitoring efforts offers a more cost-effective way to change teacher behavior and increase student learning. In Niger, adding weekly phone calls to the teacher, village chief, and two students on top of irregular teacher monitoring visits (less than once per year) increased students' math and reading test scores by 0.12–0.15 SDs [2].

However, mobile monitoring is not always effective. In some cases, it undermined teachers' motivation and did not translate to better attendance or student learning. In Côte d'Ivoire, an NGO nudged parents to take an interest in their children's school life and nudged teachers about their attendance through twice-weekly texts[27], . When NGOs nudged parents, students stayed in school, and historically higher-attendance teachers showed up to around five additional class periods per year. However, nudging both parents and teachers had no effect on teacher attendance or student dropout. In fact, historically highly motivated teachers actually showed up to school *less*. Authors suggested that too much scrutiny (via the combined teacher and parent channels) reduced teachers' intrinsic motivation. In Uganda, NGO staff trained head teachers to submit reports of teacher attendance via an online platform on their phones [14]. This local phone-based monitoring did not improve teacher attendance or student dropouts unless teachers also received a bonus payment when they had good attendance. While mobile phones may increase the ability and reach of local monitoring, policymakers should carefully consider which local stakeholders to engage and how to preserve teacher motivation.

Even when mobile monitoring did not improve attendance or learning, it may still be an attractive policy if it delivers similar attendance or learning outcomes as the status quo at lower cost.

One recent promising study shows that texting is also a cheap tool to coordinate different ministries so that monitoring translates to changes in schools and learning [16]. In Tanzania, one ministry ran a school inspection program that generated valuable tailored recommendations, but that information was failing to reach the local monitors responsible for following up with schools. A cheap mobile phone tweak unblocked this bottleneck. With public endorsement, researchers sent text message summaries of the inspection reports and reminders to local education monitors. Students learned about 16 percent more when their local monitors received text summaries in addition to the inspection.

There is mixed evidence on whether texting and calling teachers provides enough support to improve their teaching, but when it does, it could be a cheaper option. Many education interventions ask teachers to change their pedagogy but don't provide sustained support to ensure that these changes happen[2], . In-person coaches or mentors can offer effective, tailored, and ongoing professional development [2], but hiring them can be expensive, and many virtual professional development programs rely on internet access. Mobile phones offer an opportunity to make coaching interventions cheaper and even more adaptable to low-connectivity areas, though more research is needed.

When programs shared resources and support to teachers through tablets in Pakistan [9], or online discussion rooms in the United States, teachers changed their behavior and students scored better on tests. In Kenya, teachers received in-person training, semi-scripted lesson plans, and weekly text messages with brief teaching tips and motivation to use the lesson plans [24] . They also adopted a phonics-based approach to reading despite minimal in-person support. After two years, students taught by these teachers were more literate than their peers and were 60 percent less likely to drop out. A similar sustainable and affordable approach to literacy instruction has since been adopted nationwide in Kenya.

However, light-touch digital follow-up, such as text reminders, may not be sufficient to strengthen teacher professional development without more hands-on support like coaching visits, which admittedly do have high resource trade-offs for policymakers. In China, sending follow-up texts and calls to teachers after a fifteen-day in-person teacher training showed no difference in teacher attitudes and behaviors or students' math achievement, though this was likely because the training content was not practical enough and the texts focused on alerting teachers to new materials on the platform and their progress through the online platform [28], . In South Africa, a structured pedagogy program improved student literacy more when coaches visited teachers in person rather than regularly calling and texting them [15]. Researchers suggest that in-person observations enabled tailored feedback, stronger teacher accountability, and more trust built through face-to-face interactions. The in-person coaching program was about 27 percent more expensive than the virtual coaching program, and while its better learning outcomes made it a more cost-effective option, the program has not scaled due to absolute costs.

One recent study suggests that in a particularly difficult context, monitoring and coaching had to be used together to overcome barriers to student learning [1]. In Niger, researchers tested two phone-based approaches with teachers: regular monitoring calls and a package combining monitoring calls with instructional calls and texts. Monitoring alone reduced teacher absence by 12 percent, strengthened teacher motivation, and increased parent involvement but did not improve student learning in the short term. Adding phone-based instructional support further increased motivation but did not change teachers' knowledge. Over time, the two approaches together led to higher student learning, mainly in basic math skills.

Mobile phones to engage parents

When mobile phones were used to provide parents with information and guidance, parents engaged more,[10], [11], [12] , [17], [18], [19], [21], [26], [29], [31], and sometimes students learned more [10], [11], [12], [17], [18], [19], [26], [29], [31]. This is particularly effective in high-resource settings where school-savvy parents know how to engage with the education system and follow up productively. Evidence from 23 randomized evaluations shows that sharing actionable, timely guidance with

parents and caregivers on supporting their child's education boosts caregiver involvement and student learning [32], . SMS messaging is one widely used, affordable approach to achieving these outcomes. In China, weekly text messages informing parents about anemia prevention did not improve health or academic outcomes; however, a more engaging approach combining texts with quizzes for parents ultimately improved students' health, math scores, and classroom concentration [29], . Recent evidence from mobile phone tutoring in Botswana shows that some parental engagement techniques were more effective than others[5]. When tutors encouraged parents to co-lead the tutoring call, two-thirds of the parents agreed, and students learned more than those tutored solely by the teacher. In contrast, sending motivational nudges to parents, on top of the normal tutoring calls, had no impact on students' learning. This suggests that simple messages alone may not always be enough, but interactive approaches can enhance the intervention's impact at low cost.

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