

Ecuador: How Can Education Systems Ensure Online Learning Works When Crisis Hits?

When schools close due to conflict, pandemics, or other crises, children lose more than just class time. Disruptions to learning can lead to lasting gaps in knowledge and skills, while the loss of structure and social connection can harm children's mental health and well-being. Maintaining learning continuity during crises is therefore critical — not only for academic outcomes but for children's overall development.

In 2020, the COVID-19 pandemic led to school closures around the world, affecting more than 1.6 billion students. In response, more than 90 percent of countries implemented some form of remote learning. Digital instruction became the most common method, particularly at the high school level. But a key concern with online learning is ensuring students actually participate and engage in the instruction.

In Ecuador, the World Bank's Strategic Impact Evaluation Fund supported a series of experiments to test how student-, teacher-, and system-level interventions could best be used to increase student participation in remote learning during the COVID-19 pandemic. Working with the Ministry

of Education in Ecuador, researchers implemented online course modules and tested a range of light-touch interventions that could be delivered rapidly at scale. The experiments covered more than 45,000 students in their final years of high school across 1,151 schools.

Researchers found that the largest impacts came from intervening at the system level. Using a centralized online management system — where Ministry of Education personnel monitored and received weekly reports on schools' student participation in remote learning — increased both study time and knowledge compared to decentralized self-management, where only teachers received information about their own classes. This centralized approach was particularly effective for underperforming schools. Teacher-level nudges, including benchmarking emails, encouragement messages, and administrative reminders, did not improve student participation. Small financial incentives for students increased study time but did not translate into more knowledge. The findings highlight the difficulty in incentivizing online learning at scale and point to a key role for central monitoring.

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Context

Before the pandemic, Latin America was already facing a learning crisis. More than a third of students in the region were not achieving minimum proficiency in reading. In

Ecuador, 66 percent of children at late primary age were unable to read and understand a simple text. While Ecuador had made notable progress in recent years, emerging as

This policy note is based on "[System-, teacher-, and student-level interventions for improving participation in online learning at scale in high schools](#)", by Asanov, Igor, Anastasiya-Mariya Asanova, Thomas Åstebro, Guido Buenstorf, Bruno Crépon, David McKenzie, Francisco Pablo Flores T., Mona Mensmann, and Mathis Schulte, *Proceedings of the National Academy of Sciences* 120, no. 30 (2023): e2216686120. It was created with assistance from AI tools. The content has been reviewed and edited by two human editors and study authors. SIEF takes full responsibility for the final content.

the top performer among seven low- and middle-income countries on the 2018 PISA for Development assessment, its students still scored well below OECD averages. The pandemic threatened to deepen these challenges. Latin America experienced some of the longest school closures in the world, with students in the region missing an estimated one and a half years of learning on average.

This research took place as part of a larger online education project called “Showing Life Opportunities” conducted in collaboration with the Ministry of Education in Ecuador. Researchers developed online courses in entrepreneurial education, statistics and scientific thinking, and Spanish and English language for students in their final years of high school. The materials were first offered through computer labs in schools beginning in September 2019. When the COVID-19 pandemic closed schools in March 2020, the content was offered remotely for students to access from their homes.

An initial survey found that three-quarters of students had access to the internet from their homes. The interventions focused on this sample for whom technology was not the

main barrier to learning. A key concern was ensuring that students would actively participate and progress through the lessons. The experiments tested different interventions designed to increase time spent by students using the online learning platform.



Did you know

- The COVID-19 pandemic closed schools around the world, affecting more than 1.6 billion students.
- More than 90 percent of countries implemented some form of remote learning policy.
- Digital instruction was the most common method of instruction, particularly in upper secondary school.

Source: [UNESCO, 2020](#)

Evaluation

Researchers conducted randomized controlled trials in three waves, covering schools in different geographical areas in Ecuador. All interventions were based on existing evidence from behavioral science and other disciplines, with a key consideration being what was feasible to implement quickly and at scale.

Student-level interventions. All student-level interventions took place when students were accessing learning material remotely from home. The first treatment provided a financial incentive for completing lessons by giving students a lottery ticket for monetary prizes each time they finished a lesson. A second lottery treatment also rewarded scoring well on tasks within the lessons. Other interventions focused on student motivation and self-control: encouragement messages on the screen aimed to convince students they could finish the course despite the pandemic; a planning treatment

asked students to form plans of how they would study and share these plans with others in their household; and a final intervention encouraged students to team up remotely with peers to work together.

Teacher-level interventions. The first teacher intervention was a benchmarking treatment in which teachers received a weekly email showing the performance of their classes compared to all other classes of the same course type. This “social comparison” nudge was designed to induce pressure on low-performing teachers to improve. A second intervention consisted of administrative SMS messages reminding teachers that their classes were being monitored and instructing them to finish the program on time. The third intervention sent teachers encouragement emails, which included a link to a video showcasing the experiences of students and teachers who had previously finished the course.

System-level intervention. The research team implemented a real-time online management system. Schools were randomly assigned to either centralized management, in which Ministry of Education personnel had access to the management system and received weekly take-up reports about each school, or to self-management, in which only teachers received information from the management system about their class.

Researchers measured impacts on two primary outcomes: how much time students spent using the online learning platform and how much they learned. Study time was measured using data from the platform on the amount of time students spent and activities completed. Knowledge was assessed through subject tests administered through the online platform.

Findings

Centralized monitoring produced the largest impacts on both study time and knowledge.

After 8 weeks of the program, students at schools assigned to centralized management had a 0.21 standard deviation increase in study time on the platform compared to self-managed schools. This corresponds to an average of 125 additional minutes spent on the platform and 2.1 more lessons completed. Students in centrally managed schools also scored significantly better on knowledge tests, with a 0.13 standard deviation improvement at the end of the program. This improvement occurred for four out of five subjects taught online.



Photo: UNICEF/ECU/2022/Mendez

Centralized management was particularly effective for underperforming schools.

Using machine learning methods, researchers found signifi-

cant differences in how centralized management affected different schools. Schools with high test scores on national examinations performed just as well with decentralized self-management as with centralized monitoring. However, schools with below-average test scores did notably worse with self-management. This suggests that lower-performing schools particularly benefit from central oversight.

Small financial incentives increased study time but did not improve knowledge.

Offering students a lottery ticket each time they finished a lesson increased study time by 0.08 standard deviations, corresponding to about 76 additional minutes on the platform. Offering a lottery ticket that depended on both completing lessons and scoring well increased study time by 0.11 standard deviations (91 additional minutes). However, neither lottery treatment had any significant impact on knowledge scores. At a cost of \$0.17 per student, the lotteries were a low-cost way of increasing time spent on the platform, but they were not effective for increasing learning.

Encouragement messages, planning prompts, and peer team-ups had no significant impacts.

Providing students with encouragement messages on the platform had no significant impact on time spent studying. Making a plan for study and sharing it with someone else in their household also had no significant impact, nor did teaming up remotely with a peer. None of these student-level interventions improved knowledge scores.

Teacher-level nudges did not improve student participation or learning.

None of the three teacher-level interventions significantly improved either study time or knowledge on average. The benchmarking treatment had a small negative average effect on study time. However, there was some evidence that

low-performing teachers improved when shown benchmarking information, while initially high-performing teachers may have reduced effort. Sending teachers administrative SMS reminders or encouragement emails also failed to increase student participation.



Conclusion

Centralized management appears to be a highly cost-effective way of increasing both time spent on remote learning platforms and knowledge. It improved learning outcomes by 0.13 standard deviations at a cost of less than 60 cents per student.

The success of centralized management occurred in a context in which Ministry of Education personnel had both the willingness to use real-time data for monitoring and the tools to hold teachers accountable. This is consistent with research showing that management reforms improve outcomes in systems in which there is a credible threat of accountability.

Although most schools have now returned to in-person classes, online courses are likely to continue to be part of educational systems going forward. They can supplement regular programming and serve as a toolkit for future disruptions. The lessons from these efforts show how schools can be incentivized to engage in online learning—particularly that system-level interventions may be more effective than nudges targeting students or teachers

The Strategic Impact Evaluation Fund, part of the World Bank Group, supports and disseminates research evaluating the impact of development projects to help alleviate poverty. The goal is to collect and build empirical evidence that can help governments and development organizations design and implement the most appropriate and effective policies for better educational, health, and job opportunities for people in low and middle income countries. For more information about who we are and what we do, go to: <http://www.worldbank.org/sief>.

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