Tech, If Used Correctly, Could Transform Learning in India's Govt Schools

Shreya Shah, March 28, 2017

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Children can learn more with the help of technology, if the programme is well designed and implemented, and personalises content to the child's existing knowledge level, found a January 2017 study of an after-school intervention in Delhi.

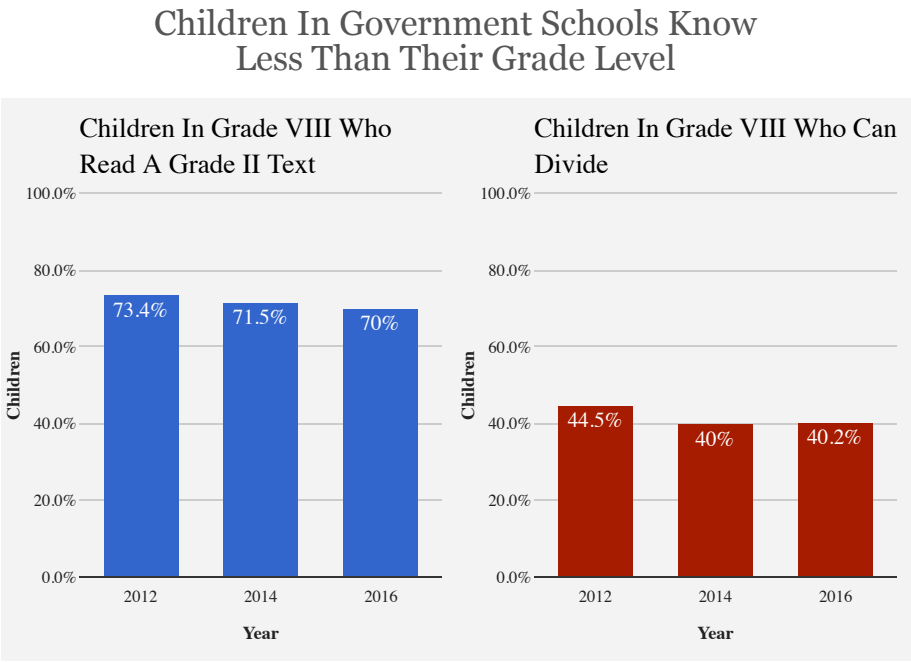
Government upper primary and secondary school children (grades VI to X) who were part of an intervention that used technology to improve learning made twice the progress in mathematics, and 2.5 times the progress in Hindi, compared to students who were not part of the programme, according to the study, co-authored by Karthik Muralidharan from the University of California in San Diego, Abhijeet Singh from University College London, and Alejandro J. Ganimian from the Abdul Jameel Poverty Action Lab at the Massachusetts Institute of Technology.

"A well designed intervention can have large impacts," Muralidharan, a development economist and professor, told **IndiaSpend**.

In mathematics, benefits from the programme ranged from a 12% increase in questions answered correctly on the easiest type of questions, to a 36% increase on harder topics, such as geometry and measurement. In Hindi, students who were part of the programme gained 7% on the easiest topics, such as sentence completion, and 19% on the hardest questions, such as understanding and answering questions on a passage.

The program could cost as little as Rs 130 ($2) per student per month, if it is implemented on a large scale, the study estimated.

India has over 130 million primary-age children between the ages of 6 and 10 years, and 120 million secondary school-age children between 11 and 15 years, according to 2016 projections by the ministry of human resource development. But as few as 40.2% of grade VIII government school students surveyed in 2016 could divide, while 70% could read a grade II level text, according to the Annual Status of Education Report, 2016, a citizen-led assessment of learning in rural India.



Source: Annual Status of Education Report, 2016

Weaker students benefited more from the intervention mostly because weaker students who only attended regular school were less likely to make any progress during the school year, according to the study. This could be because weaker students are likely to be so far behind the curricular and text-book standards that the regular instruction in class that follows the textbook is unlikely to add much learning for them, the study said.

The study analysed the impact of 'Mindspark', a software that customised material based on student answers to questions, on 314 students who attended three 'Mindspark' centres in Delhi between September 2015 and February 2016, and compared the results to 305 students randomly selected to be part of the control group. All 619 students–97.5% from grades VI to IX–were from government schools.

The 'Mindspark' software delivered learning at the level of every student, and at pace with their progress. The software also analysed patterns in student errors and delivered content that targeted these conceptual bottlenecks, something that could be difficult for teachers to address in a classroom setting.

On a large scale, the program could cost as little as Rs 130 a student

The cost per child could be about $2 (Rs 130) per child per month, excluding rent and utilities, if the programme is implemented on a large scale, the study estimated.

The programme has attracted the interest of several states, said Muralidharan. "There is enormous potential but a lot of work is needed for it to be implemented within the government school system."

The Mindspark programme in the study cost about Rs 1,000 ($15) per student per month, including infrastructure cost, hardware and software, which was cost-effective, in terms of learning outcomes, when compared to per-pupil monthly spending of Rs 1,500 ($22.5) in the schools the children belonged, the study said.

Students attended the centre six days a week, for four-and-a-half months, with 45 minutes of individual learning and 45 minutes of support from a teaching assistant in groups of 12-15 students. Average attendance at the centres was 58%.

Technology could help learning, but effects vary across programmes

Programmes that provide computers at home or in schools mostly do not have a positive impact on learning, while computer-aided programmes that allow students to review grade-appropriate content at their own pace have modest, positive outcomes, the authors wrote in the study. An intervention that could deliver personalised content as per the learning level of the student (like the Mindspark programme) could provide much higher outcomes, the authors explained.

"For most politicians, technology is hardware," said Muralidharan, adding that the political impulse is to concentrate on laptops and computers which are tangible. "Hardware by itself has no impact."

For instance, the "One Laptop Per Child" programme in Peru increased the ratio of computers to students in schools, but there was no impact on test scores in math and language, an analysis found.

Similarly, a computer-aided instruction programme in Gujarat, which replaced some time spent on regular lessons in schools, led to lower test scores, suggesting that using computers in schools could even be harmful to learning, according to a 2008 study.

"Technology has enormous potential, but it is critical how it is integrated with pedagogy," Muralidharan explained.

Technology could help with large intra-classroom differences in learning levels

Grade VI students part of the study were, on average, 2.5 grade levels below grade VI mathematics standards, the study found.

Further, students in one grade typically spanned five to six grades in terms of their learning level, which could make it harder for teachers to teach at the level of every student. "We find that the bottom third of the class is not learning anything in school," said Muralidharan.

Teaching at the grade level could miss out weaker students, while a computer programme could help personalise content as per every child's grade level, the study suggests.

*(**Shah** is a writer/editor with IndiaSpend.)*

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