

Tablet computers for global literacy

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Children in an Ethiopian village use their tablets to learn the basics of reading and writing.

In two remote villages in rural Ethiopia, a team of literacy and technology experts from Tufts and MIT launched a grand experiment with a simple gesture: they dropped off a handful of tablet computers for 40 children who'd never seen anything like them before—they hadn't ever attended school or seen electricity or paper. The tablets contained specially designed apps to help illiterate children learn the basics: letters and sounds and, eventually, reading fundamentals.

Within minutes of receiving the tablets—with no instructions or explanations—one boy figured out how to turn on the computer. Within a week the children had all the apps up and running. Was it possible that this kind of instinctual learning, outside the realm of a formal classroom, could help reverse widespread illiteracy around the world?

The potentially groundbreaking project—kickstarting literacy for some of the 800 million people worldwide who cannot read or write—began quietly enough, when a mutual friend introduced Maryanne Wolf, founder and director of Tufts' Center for Reading and Language Research (CRLR), to Nicholas Negroponte, founder of the MIT Media Lab. Negroponte had started the One Laptop per Child Association back in 2005 to provide children in underdeveloped countries with computers, but he was eager to do more.

For six months in 2011, he and Wolf debated the possibilities. Could computers really teach children to read? And could children who had never even seen a sheet of paper, let alone a computer, figure out how to use a tablet?

Together with Cynthia Breazeal and Tinsley Galyean of MIT, Stephan Gottwald from CRLR and Robin Morris of Georgia State University, Wolf and Negroponte formed the Global Literacy Project to test out their ideas. After deciding to run a pilot project in rural Ethiopia, Wolf and her colleagues chose to try and teach the children in English, the standard second language taught in schools in that country.

They might have picked Oromo, the language spoken in the villages, or Amharic, the country's national language, but there were no appropriate computer applications in those languages. And parents want their children to learn English—as does the Ethiopian government—because they believe English proficiency will help their kids' employment prospects.

Then came the task of figuring out how best to teach reading fundamentals to children without the benefit of a classroom. Wolf's lifetime of research on literacy and the development of the reading brain provided the foundation that helped the team select an array of more than 300 apps: e-books of children's stories, videos and other self-learning tools and activities. Each app addresses some of the basic processes needed to learn to read: the alphabet, letter-name knowledge, letter-sound correspondence, basic decoding principles and sight word recognition.

Quick Studies

Wolf traveled to Ethiopia in February 2013 and saw firsthand how excited the children were with the computers. She visited the two villages, each about 50 miles from Addis Ababa, the Ethiopian capital. Wonchi, an agrarian community that sits on the rim of a volcanic crater, can only be reached by foot or pack animal after the dirt road ends, and Wolonchete, located in the Great Rift Valley, is so isolated that villagers have to walk two and a half hours to the nearest source of water.

"The children learned to be so facile so quickly—it was breathtaking," Wolf says. "They have no electricity, had never seen paper and pencil, but in one week, they were able to turn each application on."



“The idea is to create a way to teach reading anywhere,” says Maryanne Wolf, seen here with some early learners in an Ethiopian village.

Soon a problem well known to technology users emerged: the boy who had taught his peers how to turn on the tablet had also learned how to turn on the tablet's camera, which had been shut off intentionally. No one minded the first hacker in the village.

Two computer engineers from the University of Addis Ababa taught the villagers how to use solar power units to recharge the tablets each night. The engineers visited the villages twice a month to maintain the equipment and to swap memory cards, so that researchers could study how the children had used the tablets.

The preliminary results are promising. Even though the 40 children in the two villages had never seen a written word, within a year, they had learned the alphabet, could recognize some words by sight and had

figured out how to use applications that would help them learn even more. One of the apps that was especially successful, TinkrBook, was developed at MIT. It presents an interactive story that invites children to tinker with the text and graphics to explore how these changes affect the narrative.

Wolf, who is the John DiBiaggio Professor of Citizenship and Public Service at Tufts and holds a secondary appointment at Tisch College, says literacy improves multiple aspects of people's lives: cognition, health, economic employment, gender equality and general well-being. The consortium's goal is to bring the potential for literacy to 100 million children around the world by the end of the decade.

The group also plans to bring tablets to India, Bangladesh and Uganda, as well as to rural American communities where there aren't preschools. "The idea is to create a way to teach reading anywhere," says Wolf. "We are building an overall template for teaching in any language."

Some apps are in the process of being developed by students at Tufts and MIT who are taking courses with Wolf, Gottwald and Galyean on reading and language fundamentals. They are also working on ways to assess children's progress in oral and written language development.

The Digital Genie

What will happen next for children who learn to read, but do not have access to school? Some critics of technology, says Wolf, have advised the consortium to allow oral cultures to remain that way and to leave them alone. But Wolf says that like technology itself, literacy is a tool whose positive contributions outweigh the negatives.

A professor in the Eliot-Pearson Department of Child Development, Wolf has embraced global literacy as the new focus of her academic life.

"It's the single most important application of my knowledge that I could ever imagine being able to pursue in a lifetime," says Wolf, whose research focuses on reading development and dyslexia.

She appreciates that there is some personal irony at work here. In books, articles and speeches, Wolf has decried digital reading on the Internet and its emphasis on speed and multitasking; she says the online environment can interfere with what she calls "deep reading," the ability to apply critical analysis, inference and insight. Yet now she is relying on the very technology she has critiqued.

"I am a critic of digital modes of reading, which is ironic, but in a positive and constructive way," she says. "The digital genie can't and shouldn't be put back into the bottle. We're in the era of screens and digital culture. We must learn how to use this new tool in the best way."

Giving [children](#) who would otherwise never become literate a technology that might someday propel them to [literacy](#) is a step in that direction, she says. "In the process I hope to contribute to figuring out ways that the medium can redress its own weaknesses."

Provided by Tufts University

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