LIZ STINSON 10.27.15 07:00 AM

In This Classroom, Knowledge Is Overrated

October 13, 2015. Students participate oin a mock SOLE at the SOLE-NYC lab at PS 197m in Harlem, New York City. First SOLE (Self-Organized Leraning Enviorment) in the US and coordinated by Natalia Arredondo of SOLE central will inagurated in October 14, 2015. Photo Credits: Juan Arredondo for SOLE-NYC.   JUAN ARREDONDO

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SUGATA MITRA IS looking for a question.

"We need a really strong, powerful question," he says to a couple dozen

New York City neighborhood of Harlem. The students, who are scattered cross-legged on the floor of the classroom, eagerly shoot their hands into the air.

Mitra calls on a boy in a t-shirt. "Let's hear your question."

He stands up. "I want to know, why do dogs chase cats?"

"I've never thought of that before," Mitra replies, scratching his head before calling on another student.

TRENDING NOW

but there are a number of people

"How come father seahorses have babies and the females don't?"

And another.

"How do you make a computer?" a young girl shouts.

Mitra, a researcher at Newcastle University and winner of the 2013 TED Prize, ponders the suggestions for a moment, before deciding the first—why do dogs chase cats?—to be the most intriguing of the bunch. He informs the students they'll have 20 minutes to find the answer to the question, but under a few conditions. First and foremost, they can't talk to adults. Second, with 24 students and only six computers in the room, they're going to have to form groups and work together. And lastly, they can and should read each other's answers.

"I tell them if they want to see what another group is doing they can just walk across the room and look," he says. "Children often say this is cheating, but I tell them no, it's not called cheating, its called sharing."

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Mitra and his students are in the middle of demonstrating a SOLE session. SOLE stands for Self Organized Learning Environment. It's a new teaching technique developed by Mitra as a way to encourage children to have autonomy in their learning process. Teaching using the SOLE method involves an educator posing a big question and students self-organizing into groups so they can research the answer using online tools. The classroom Mitra and his students are in is the first SOLE Lab to open in the United States, though he's opened six others in England and India since 2013.

At PS 197, every grade will cycle through the lab once a week, but fourth grade will go every day for science classes. Natasha Spann, the school's principal, explains that the core curriculum that the teachers follow will remain the same, but the teaching technique will change. "It's hard for teachers to sit on their hands," she says. For instance, students in kindergarten might be learning about trees, so the big SOLE question could be something like, can we eat the bark of a tree? Or students in third grade, who are learning about world geography might be asked, how can animals reshape the landscape of a geographical region? The goal of these big questions is to prompt students to think about a subject matter holistically.

Natalia Arredondo, a PhD student under Mitra at Newcastle University who will be running the SOLE lab at PS 197, says the school will continue to assess students the same way as before (i.e. traditional tests), though she admits that's not ideal (Mitra is currently working on assessment

examination room, the skills to be tested need to be changed," she says. "'Googleable'" knowledge becomes obsolete and the skills to find things in the internet, to be able to discern the information for accuracy and relevance, become more important."

Mitra describes SOLE as "learning at the edge of chaos," and indeed, as the students break off into self-chosen groups, a wild chatter fills the room. It looks disorganized, and remains that way for a few minutes. But the students quickly settle down and begin to type the exact question Mitra posed into Google: "Why do dogs chase cats?" On Google, a little box pops up with a brief explanation from the American Society for the Prevention of Cruelty to Animals. The children dutifully scribble the few sentences down onto jumbo pads of paper. Some groups navigate to YouTube to watch a video. Nearly all of them write something similar.

I point this out to Natalia Arredondo, a PhD student under Mitra at Newcastle University who will be running the SOLE lab at PS 197, and she nods and says that's totally normal. "When they do their presentations they start finding conflicting information," she says. "That's where the learning takes place."

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Mitra is something of a heterodox in the education world. You might know him from his blockbuster TED talk in 2013, in which he describes his famed hole-in-the-wall experiment (the one that inspired the story of *Slumdog Millionaire*). In 1999, Mitra cut a hole in the wall of his office building, which bordered the Kalkaji slum in New Delhi, and filled it with a computer. Mitra was curious to see how children, with no prior knowledge of how a computer works, might react to this piece of technology that appeared seemingly out of nowhere. Turns out, they took to it instantly. The children were able to teach themselves how to use the computer without instruction. They even began teaching themselves basic English so they could use search engines and email.

Mitra began running more ambitious experiments in other underdeveloped communities. In 2010, he loaded a computer with educational material about molecular biology—in English— and dropped it off in the Indian village of Tamil Nadu. The children, ages 10 to 14, spent the next 75 days familiarizing themselves with both the computer and its contents. When Mitra returned, he gave the children a test to see how much progress they made, and found that they could answer one in four questions correctly. He

would casually guide the conversation and answer questions. When he returned a second time, the students could answer 50 percent of questions correctly and had a working understanding of concepts like DNA, chromosomes, and heredity.

These findings led Mitra to the theory that has come to define his professional career: Kids don't need teachers in order to learn; they simply need each other—and an internet connection. Mitra, like fellow radical education proponents, believes the industrial-age educational system is on the cusp of extinction.

"I have serious doubts about whether the traditional teacher-mediated model of learning will survive the next ten or fifteen years," says Richard Elmore, a professor at Harvard's school of Education. Replacing it will be a technology-enabled style of learning that allows children to access multiple resources for education—think SOLE sessions or Kahn Academy lessons—at their own pace, driven by their own curiosity.

This style of teaching—or, perhaps more accurately, not-teaching—is often referred to as "minimally invasive education." Mitra believes that the internet has made our collective knowledge base so vast and accessible, it's no longer helpful or necessary to sit children in rows and pour facts into their brains. Mitra calls this old method of teaching "just in case" education, and in his view, it's a waste of time. There's no need for a teacher to explain how a volcano erupts because if students need to know, they can look it up online.

Elmore believes that educators tend to underestimate how well children can self-regulate the learning process. It comes down to a retraining of sorts—reminding people that learning isn't about memorization but about knowing how to access and analyze the wealth of information available. "The real argument is whether we want to develop a generation of people who have mastery of their own abilities to learn, or whether we want to perpetuate our obsession with training people to reproduce from memory what the current generation of adults thinks they should know," he says.

JUAN ARREDONDO

Mitra likes to say "knowledge is obsolete," which is really just a provocative way to say that facts and memorization are no longer relevant. That provocation has earned him some skeptics who believe the rhetoric behind SOLE and the Hole In the Wall has been inflated beyond its effectiveness. "When I read something about knowledge being obsolete, it bothers me," says Punya Mishra, a professor of educational psychology at Michigan State University. "It's not about just looking up facts. A big part of learning is developing knowledge structures, ways of thinking, and forms or representations of that knowledge. And those don't come easy."

Leaving children to figure those things out on their own is too big a burden, Mishra says, adding that he does believe that independent, open-ended learning is a good thing as long as there's a teacher to frame the problems and the answers in a productive way. There's a skillset a child must possess in order for self-guided learning to be effective. When you give a 9 year old access to the internet, it requires a level of digital literacy. Anyone can pull up a Wikipedia page to find an answer, but is that really the best source? And once a child has that information, how can you ensure he or she has more than just a superficial grasp on it?

Mishra recalls a moment when his son was a freshman in high school. He was learning about unit circles in his advanced math class and was struggling to understand the concept. Mishra told him that he should do some research on the internet to get more context. "I came back and he's reading the Wikipedia page," Mishra recalls. "And I said, why are you reading the Wikipedia page? You might as well read the textbook." He son replied that he didn't know what else to look for, so Mishra sat down and Googled "unit circle simulation." "Suddenly a whole new world of the

this information on his own, says Mishra, he just "doesn't know what he doesn't know."

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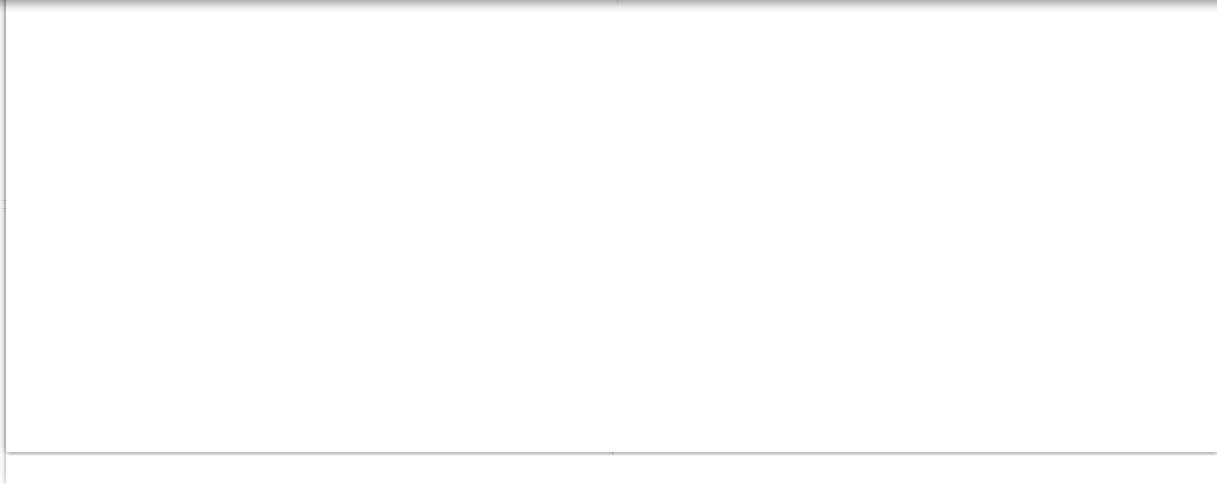## How Quickly Can Atoms Slip, Ghostlike, Through Barriers?

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