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Education

# Students take field trip to virtual rain forest without leaving the classroom

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The classroom lights are off. On the walls, insects flit under a rainforest canopy and animals hide among the trees. The Grade 10 students can hear the sounds of Borneo.

It's an animated version of a rainforest, projected onto three large screens, but there is real mosquito netting in one corner. University of Toronto researcher Michelle Lui has created a virtual learning ecosystem, one that casts the teenagers as field researchers, on the lookout for a clouded leopard or other species in the Borneo rainforest.

"It is like an exhibit at a museum.," says Ms. Lui, a graduate student at U of T's Ontario Institute for Studies in Education and the Knowledge Media Design Institute.

She and teacher Maria Niño-Soto spent 20 weeks developing and tweaking the virtual rainforest, which offers, in essence, a field trip without leaving the classroom. They want to know if this kind of immersive learning environment can engage students and help them learn. The most recent session was about biodiversity. In January, the rainforest will be used to teach the students at University of Toronto Schools about evolution and how species and geography can change over millions of years.

At the end of year, Ms. Lui and Dr. Niño-Soto, a former research scientist, will compare the exam results of students who learned in the immersive classroom to those who were taught the same material in a more conventional way. They are also asking the teens about the experience.

Each student has already studied one species, and where it fits in the food web.

"They have a knowledge base," says Jim Slotta, who is Ms. Lui's supervisor. "We wanted to avoid having the kids walk into the room, and say 'Yeah, I think there are some trees there.' We want them to be looking for the biodiversity, understanding the rainforest. There is a bigger curriculum design story. It is not just a pre-loaded game that they play."

It is also important that the students work together. There is a slightly different Borneo forest on each wall. One hasn't had rain for months, while another is starved for sunshine. A third was recently rocked by an earthquake. The students post their observations on a smart board

so everyone can see. Their goal: to put all the clues together and correctly identify the different scenarios.

Immersive environments could allow students to undertake a virtual journey through the human heart, or inside a cell, says Dr. Slotta. It can also involve an imaginary world, like one created by Tom Moher at the University of Illinois in Chicago.

“WallCology,” is being used in another study under way in Toronto, this one with Grade 5 and 6 students. A series of large monitors is mounted on the walls of the classroom, says graduate student Mike Tissenbaum. It is designed to appear as if the students can see through the walls to the plumbing. They can also see insects, and observe them as they lay eggs and eat different types of moss.

The students use tablet computers to record their observations and, together, they investigate insect ecology. They learn about food webs and how to do population counts.

“It is not just the environments, but what the environments allows us to do,” Mr. Tissenbaum says. “Working with others. Building ideas. Using these complex sets of data.”

Dr. Slotta says that even though children know they are looking at a monitor, not a real wall scope, they suspend disbelief.

“It is like being immersed into a book,” he says. “They can fall into a story and you can leverage that.”

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