

THE WORLD'S BIGGEST SCIENCE CLASS

Science students around the world link up via the Internet to share and compare their knowledge and improve their skills.

Linda Maston's students were once cut-off from the rest of the world. Their eighth-grade science classroom in Pease Middle School in the tough inner-city neighbourhoods of San Antonio (Texas, USA), even lacked windows. That suddenly changed when computers with Internet connections were placed in the classroom: Linda's students then had virtual access to the entire world. Yet as useful as Internet resources can be for science education, the greatest resource connectivity provided was access to other students.

"What are some of the CO₂ levels that people are getting inside their various classrooms? Ours are extremely high."

Linda's students issued this simple message while studying their local environment as part of The Global Laboratory Project, an international, full-year, introductory science course designed around telecommunications. Funded by the US National Science Foundation, Global Lab was created by Dr. Boris Berenfeld, a Russian-born scientist and educator, at TERC, a leading educational research organization in Cambridge (Mass., USA) and member of the Learning Without Frontiers Task Force. Since its creation in 1991, Global Lab has linked over 300 middle-school classes (generally between the ages of 12 and 15) from more than 20 countries.

A COMMUNITY OF LEARNERS

What sets Global Lab apart is its use of telecommunications to create a global community of learners. Students use low-cost but accurate instruments, specially developed for the project, to measure key characteristics of their local environments such as air, soil and water temperatures, soil and water pH, water salinity, light intensity and UV radiation, and ozone and CO₂ levels. Each class creates its own web site that is linked to that of the project (<http://globallab.terc.edu/>). Students use the web to share and compare their findings, just as scientists do. Once they have acquired basic investigative skills, they collaborate with their peers worldwide to choose and conduct their own investigations.

Linda's students had measured high CO₂ levels in their classroom. Thanks to Global Lab, they then were able to turn to

their peers for help. Global Lab colleagues at Kennedy Middle School in Aiken, South Carolina, USA, replied to the above message.

"We read your report and have a similar case here. All our classrooms have windows but we tested the carbon dioxide levels in the trailers where a lot of our classes are. (Our teacher) thought they would have higher levels. Not!! The regular classrooms had higher levels... We explained this by the hallways. Regular classrooms open into the hallways, while the trailers open into the outdoors... So when the class changes, you get fresh air in the trailers. In the regular classrooms, you get stale air from the hall."



TESTING WATER SAMPLES
FROM THE STUDY SITE
(Photo © All rights reserved).

The Global Laboratory is based on the fact that learning is social. Adults have always learned from each other through apprenticeships, guilds and even the tribal hunt. Telecommunications in classrooms allow students to learn from each other. Their jointly-conducted real-world investigations provide them with social and collaborative skills that are difficult to develop in traditional classrooms, and allow them to put their local findings into global contexts. They learn to construct, evaluate, present and critique information.

Linda Maston's students reported their findings to the local school board which dispatched four environmental control officers

to investigate. "As soon as we pulled out our data and the graphs," said Linda, "the officers started to take notes." The officers decided to measure classroom CO₂ levels with their professional equipment. "The moment of glory came," Linda continues, "when the officers got exactly the same reading as we got!"

As a result, the school's ventilation system was repaired and Linda's students experienced a deep sense of accomplishment and empowerment. "They were so proud of themselves that they had managed to do what nobody else had been able to accomplish in 17 years. They are so used to failure that it's hard to convince them sometimes that they're doing good work."

WORKING TOGETHER

Global Lab also teaches students that when collaborating with peers worldwide, they are expected to work in a responsible and timely fashion not for their teachers but for each other. For example, when students from a Moscow high school detected errors in the data submitted by other Global Lab classes, they sent the following message to the community:

"It is natural for every scientist to make mistakes. But the low accuracy of the data may lead to wrong conclusions. In science, this problem is one of the most important. In our scientific community, we have to overcome it too... We invite everyone who has any idea on improving the accuracy of our work to communicate with us."

Indeed, Global Lab is the fulfilment of a dream of Dr. Berenfeld and his colleagues to enable students from different nations and cultures to communicate and learn together. "Transnational learning communities make education more engaging and contemporary for students and empower them to learn as scientists, scholars and professionals learn," says Dr. Berenfeld. "In doing so, the great potential of classroom telecommunications becomes realized as students acquire the knowledge, skills and attitudes they will need for life and work in the 21st century."

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