

PEOPLE

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Marina Bers


Marina Bers, a new faculty member in education, says we all need to speak the language of technology.

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Wedding the worlds of education and technology

by Marjorie Howard

While classrooms throughout the country are spouting computers, many wind up sitting unused in a corner because teachers aren't quite sure what to do with them. To help wed technology and education, Tufts has hired a new faculty member who speaks both the language of the classroom and that of technology.

Marina Bers is an assistant professor in the Eliot-Pearson Department of Child Development. With a master's degree in educational technology and a Ph.D. in media arts and sciences from MIT's media laboratory, her work is part of a new Tufts program involving mathematics, science, engineering and technology education. This multidisciplinary endeavor includes the departments of Child Development and Education in Arts & Sciences and the electrical engineering and computer science department in the School of Engineering. The collaborative effort eventually will lead to a graduate degree program in mathematics, science and technology and engineering education in which students will be able to earn an M.S. degree and a Ph.D.

Finding better ways

The program is an outgrowth of efforts to find better ways to teach science and math. Last year, the Massachusetts Board of Education adopted a proposal to revise the state's K-12 science and technology curriculum and require that engineering be taught in elementary and middle school and as a full course in high school. The proposal to the state was made by Ioannis N. Miaoulis, dean of the School of Engineering and founder of the Center for Engineering Educational Outreach, which helps children learn math and science by teaching engineering.

Joining Bers as a new faculty member in the program is Barbara Brizuela, assistant professor of education. A third faculty member will be hired to focus on science education. The program is being coordinated by Analœcia Dias Schliemann, professor of education.

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IN THIS CORNER

Brain gain



Bers is teaching a new course called "Curricula for Young Children: Math, Science and Technology" and is drawing students from child development, education and engineering. Some of the engineering students are interested in teaching or working for software companies that develop educational programs. The education and child development students are interested in learning how to better use computers in the classroom.

Creating a culture

"People going into education need to know more about technology," said Bers. "They should feel comfortable with technology and should be able to recognize what software tools they should use and be able to integrate technology into the curriculum. In general, schools want to do more with technology but don't know what to do or how to use it. But you want to create a culture. One teacher alone can't do it."

Bers said there are two philosophies about using computers in the classroom. The instructionist approach says computers should be used to find and convey information. The constructionist approach says the computer is a tool with which to design and make meaningful projects to share with others.

The underlying philosophy of Bers' course is that people learn better when they are engaged in making and designing their own projects. Many software programs used in educational technology have children merely engaging in drills, she said. "This is just a very poor way of thinking about technology in the classroom. Children learn better when they use computational tools that allow them to make their own projects and engage in a design process.

"This can be illustrated with two different approaches as to how to use the Internet in school," Bers said. "If children are doing a project on the Amazon, the teacher can instruct the child to look at web sites about the Amazon and then test them to see what they learned. Or the teacher can involve children in making their own web sites about the Amazon based on their research. When you make something, you learn better because you have to choose what is pertinent."

We're all 6 years old

Working at a computer lab at Eliot-Pearson, Bers' students are learning to design web sites, make their own computer programs to use animation and create curriculum and design interactive robot artifacts. Some students made web sites and programmed them to show animated people or butterflies; one had a set of piano keys, and when the mouse was clicked on a key, it sounded a note.

"In this class, we're all six years old and exploring and using trial and error," said Bers. "I don't give a lecture on how to program; they learn how to work it out on their own and with their peers. The first thing you have to do is break down the idea that if you do something wrong, you will wreck the computer. Then I say it's okay to cheat. One person might figure out how to program a Lego car to turn but not how to make it go forward. Someone else might figure out how to go forward but not how to turn. They work together and help each other out. It breaks the idea that computers isolate people. All the projects have to be documented online so students must reflect on their own learning experiences and also create a kind of blueprint that others could use and adapt for themselves.

"All disciplines now work together. The most important thing is to talk to each other. My role is to help establish a link because I speak both languages, that of education and that of technology. Today it doesn't matter so much what your major is. Disciplines are fluid."

Bers plans to start a research group with students from different fields. "I want to help create a culture where people think: What technology can be used? In which context? The goal is to create a learning environment where students can see themselves as designers able to invent new technologies according to the needs of their own disciplines. Technology is here, like it or not. You need to know how to use it in a good way."

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