

COMPUTING ACROSS CURRICULUM

High school chooses NeXTSTEP for curriculum development *Glenbrook South High School*

Kimberly Schmidt, Ryan Kaufman, and David Jeske don't have after-school jobs at fast food joints or local malls like many of their 2,000 schoolmates at Glenbrook South High School. Instead, they earn their spending money along with real practical experience developing NeXT software applications and simulations for use in high schools and universities.

"NeXT machines have opened up the learning environment for students beyond our walls," says John McConnell, instructional supervisor of mathematics. "NeXT machines have shown students at all levels that they can contribute something significant to the world by learning to use computers."

For the past year, Glenbrook South, in cooperation with Argonne National Laboratories, has worked toward integrating the use of NeXT computers into its mathematics, science, and writing curricula. With help from McConnell and Glenbrook students, Argonne has developed a variety of education applications—from pre-calculus tutorials to collaborative problem-solving sessions—for use on the NeXT computers. Argonne also plans additional collaborations with schools in Florida and Texas. Glenbrook South's sister school—Glenbrook North—already has a lab of NeXT machines and will begin using them for instruction in the fall of 1992.

Although Glenbrook South already had a large Macintosh lab on site, McConnell says the school installed NeXT machines because "the hardware and bundled software applications were unbeatable for our purposes. NeXT was the best we could get for our dollars. In fact, the price of a NeXT machine with eight megabytes of RAM and bundled software was less than the price of configuring a Macintosh SE. We know we're going to get many years of good use from these machines—a very important consideration for any educational institution."

Currently, mathematics instructors use NeXT machines and *Mathematica* to teach advanced algebra, precalculus, and calculus. Science instructors use MediaStation to present material on cell life and chemical components as well as animated examples of different crystalline structures. Students have begun using NeXT machines in the school's computer lab on their own—for composing history and English

papers, as well as communicating with their instructors via NeXTmail. Just a semester after instructors began using the machines in the classroom, individual use of the computers has skyrocketed, according to McConnell.

“The NeXT machines are creating a more lasting, realistic and active learning experience for our students,” says McConnell.

In calculus classes, students use *Mathematica* to solve complicated integration problems, compute tangent lines of derivatives, and graph polar functions. They're easily able to change functions, revise calculations, regraph solutions, and make conjectures about the results—things that weren't possible in the days of pencil and paper. McConnell recalls, “In days gone by, teachers said to students, ‘Here's the rule, now go graph it.’ With NeXT machines students and teachers have the technology to be incredibly more flexible. We have the opportunity to delve deeper into problems.”

Besides the traditional problem-solving tasks, McConnell says he frequently gives his students writing assignments in which they must explain how they derived a solution for a particular problem. NeXT, he says, provides the “perfect platform” for writing about mathematics.

“The 17-inch screen is critical for allowing students to access math and writing documents simultaneously,” he explains. “The screen is so large that it's easy for the students to have *Mathematica* windows up along with the WriteNow documents. They can easily cut and paste information from one application to the next.”

McConnell says NeXT's UNIX platform and Ethernet networking system are also pluses for faculty and students.

“UNIX now plays a major role in our school district's computing environment,” he says. “We felt we were making a move toward cutting-edge computing by investing in a UNIX-based system, like NeXT. In addition, NeXT's Ethernet network is quick and efficient. Even if we're running a lot of applications, the network doesn't get bogged down. Apps appear on screen very quickly.”

Looking ahead, McConnell wants to begin using NeXT machines in Glenbrook's introductory mathematics courses, including geometry and algebra. When the NeXT lab at Glenbrook North is functional, he plans to run NeXT-based classes simultaneously so North and South students can communicate with one another about particular assignments.

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