A LOOK AT NeXT IN HIGHER EDUCATION

It's been nearly four years since we introduced the first NeXT computer. Since then the impact of NeXT technology on campuses from Columbia, Missouri, to Monterrey, Mexico, has been far-reaching indeed. Almost daily, we hear of institutions that are radically reshaping curricula at the hand of NeXT computers; faculty who are creating innovative courseware; researchers who are drastically shortening the time it takes to develop intricate simulations and models; and administrative staffs who are not only increasing productivity but improving the quality of their work. We're pleased to share a sampling of the many extraordinary ways that NeXT users have accelerated the process of

learning and discovery.

Compiling this section has been gratifying for the NeXT on Campus staff. We were pleased by the diversity of institutions that use NeXT technology—Ivy League colleges like Columbia and Princeton; top engineering schools, including the Colorado School of Mines and the Rose-Hulman Institute of Technology; and small liberal arts colleges, like Davidson College and Gettysburg College. We were also pleased to speak with representatives from a broad range of disciplines in which NeXT technology is used, from mathematics, the sciences, and engineering—where since its inception NeXT has been embraced for teaching and research—to the humanities, including foreign language, history, philosophy, art, and English.

Nancy Foreman and John Barson are two of the many liberal arts faculty who appreciate NeXT's integrated combination of workstation power, graphical user interface, and advanced object-oriented development environment.

"For so long, in English and humanities classes, we used computers solely as word processing tools," says Foreman, an English instructor at the University of Kentucky. "But NeXT's multitasking environment, virtual memory, and great graphical interface allow us so many other options."

To Barson, a professor of French

at Stanford University, NeXTSTEP was an inspiration for creating a multimedia language-learning application for his students: "It would have been impractical for me to create the application without NeXTSTEP. NeXT provided a number of new standards that were necessary for this application to be effective, including a large, clear screen, the capacity to store hours of speech on a single computer, built-in recording and sound playback, and a library of software objects that saved many months of programming."

Now, faculty, researchers, students, and administrators have found a single platform that is well-suited for all aspects of their work. Even today, most platforms are adequate for certain tasks but not others. Macs and PCs work well for documentation and communication, but are vastly underpowered for serious data analysis or software development. As a result, many educators either rely on their computer to do things for which it was not designed or use more than one machine to get their work done. With NeXT technology, however, they can complete all of their work on one machine. As Ron Foreman, a professor of botany at the University of British Columbia said, "Since I purchased a NeXT, my PCs, Mac, AES, and Xerox machines just gather dust."

NeXTSTEP: The only platform that meets all the demands of campus computing

The combination of NeXT hardware and more than 30 software applications that come bundled with every NeXT machine—including Mathematica, NeXTmail, Digital Librarian™, and Webster's Ninth New Collegiate Dictionary®—makes for an extremely powerful environment. Support for Ethernet networking is built into every NeXT computer. And hundreds of off-the-shelf software applications provide users with a host of options for conducting analyses, preparing presentations, and creating teaching aids. Multimedia applications, like MediaStation and Knowledge Tool, are excellent tools for developing interactive tutorials and dynamic classroom presentations. And NeXTSTEP has emerged as the outstanding platform for running Mathematica, an application hailed as one of the most valuable tools for research, technical publishing, and courseware development in the mathematical and scientific fields. NeXT is the only workstation that supports the Mathematica Notebook front end and the only platform that lets users build object-oriented front ends to Mathematica.

"There is no computer-mathematics environment that even comes close to the power of Mathematica combined with NeXT's ease of use and UNIX utilities," says Gautam Dasgupta, associate professor of civil engineering and engineering mechanics at Columbia University. "This year, we've been able to do 10 to 12 times more examples in my classes than ever before using the Notebook front end with the NeXT. Problems that used to take a lot of class time, I don't even review in class now. Students work them out on the computers as hands-on classwork."

Object-oriented development tools let users create courseware in 'real time'

For users who need to create their own applications, NeXT is the only platform to provide a complete set of object-oriented development tools. Users have access to everything from windows and scrollers to a text object that would stand out as a great word processor on most other systems. With less code to write and the ability to modify objects and revise entire applications without delays, programmers cut development time by 5 to 10 times. Says Joel Smith, director of educational computing services and an assistant professor of philosophy at Allegheny College, "I'm able to create applications in real time. And applications are not carved in stone once I've finished. I'm constantly modifying them based on student response."

Perhaps the most difficult task in application development is creating a user-friendly interface. Programmers can devote up to 90 percent of development time to constructing the interface. NeXTSTEP provides Interface Builder™ and several objects kits—a complete environment for constructing and testing user interfaces. NeXTSTEP also encourages custom objects to be developed and shared and then dynamically added to the Interface Builder environment.

Gregory Wakefield, an assistant professor of electrical engineering and computer science at the University of Michigan, used the NeXTSTEP development environment to create SPEL, a customized application to teach signal processing. "In creating SPEL, we've really taken advantage of Interface Builder," he told us. "We can lay down algorithms and just play them out on the screen, thereby experimenting with a number of alternatives. This isn't possible in other environments. . . SPEL could have taken years to create, but on a NeXT machine, the development cycle was two months."

NeXT users share ideas, applications, and objects

More and more, collaboration and sharing of objects and software among NeXT users is taking place across disciplines. This summer, students and instructors from the University of Houston and Rose-Hulman Institute of Technology will co-develop objects that their schools and other institutions can share. Several Rose-Hulman students and faculty members spent the past two summers creating 50 custom mathematics, physics, and engineering applications; they're available as public domain on the Internet.

Says Paul Lansky, a professor of music at Princeton University, who has also created several public domain applications, "For the first time, we're able to share a lot of software with people all over the country. Being able to share establishes a sense of community that is really lively and interesting; it makes the whole development process much faster."

In the following pages, you'll discover that Lansky's thoughts on collaboration, Greg Wakefield's experiences in application development, and Nancy