

## *The Need for Technology-Rich Teacher Training*

Educational technology is supported through numerous programs by state and federal government agencies in the form of roundtables, grant programs and research to keep America ahead of the expanding technology curve. Yet, the high-level of attention has not solved the most vexing issues pertaining to educational technology—preparing pre- and in-service teachers to utilize technology for the benefit of all students. In 1995, a study by the U.S. Congress Office of Technology Assessment found that teacher training programs were not adequately preparing teachers to use technology in their jobs. Recent studies by the International Society for Technology in Education indicate that this remains largely true. Today, only 20% of teachers feel that they are well prepared to integrate technology into the classroom.

Several factors bring greater urgency for national efforts to strengthening teacher education. The U.S. Department of Education estimates that as the number of students and demand for smaller student-teacher ratios increase, the education system will hire approximately 2.2 million new teachers over the next decade. In addition to the increased demand for teachers, many in-service teachers are simply not aware of the ways in which technology can be engaged to teach a variety of concepts. Consequently, teachers with basic knowledge of the Internet and application programs do not seek further training on their own. In the words of Cheryl L. Lemke, vice president for education technology for the Milken Family Foundation, "Teachers don't know they don't know."

Most teacher training programs today offer one course in educational technology as a requirement of their education programs—not enough for new teachers to gain a broad understanding of technology's possibilities in advancing educational quality. Moreover, current teacher training programs place tremendous focus on the technology alone rather than on the learning outcomes that it should foster. The fact that computer-based information-processing power is doubling approximately every two to three years complicates the issue further. As a result, technology-focused training loses much impact as technology changes. Today's teachers are trapped in a cycle of under-preparedness to truly integrate technology into the classroom and American schools continue to struggle to make the best use of technology in the classroom.

The College of Education at Lehigh University has long recognized the important and integral role of technology on the future of education. Distinguished from its teacher training and innovations in educational technology, the College has made educational technology an institutional priority. To ensure the greatest possible immersion in educational technology, the College redesigned a shared core for its primary education programs effective in fall of 2000. The new shared core guarantees that every new teacher educated at Lehigh will enter the classroom with knowledge of web-based and multimedia learning methods rarely found among educators today.

*NOT YOUR TYPICAL COLLEGE OF EDUCATION ...*

*HAMMER VS. CARPENTRY...*

*The Classroom of the Future*

The primary goal of teacher preparation at Lehigh is two-fold: to prepare teachers for the classrooms they will enter today, and to prepare our teachers for the classrooms they will help shape tomorrow. Lehigh supports this aim through the teaching strategies modeled, in the curriculum taught, and the physical environment provided to our pre- and in-service teachers. To offer students an environment that reflects the realities of today's classrooms, and the possibilities of tomorrow, the College of Education has developed a dedicated, multiple-room suite named the **Classroom of the Future**.

The Classroom of the Future will enable pre-service teachers to experience technology as a powerful teaching tool and to inspire the development of creative, technology-rich curricula by concentrating on learning rather than technology. One of the primary objectives of the Classroom is to make technology invisible, focusing on effective transmission of knowledge, not on wires, software, and hardware—a laboratory for exploring the potential of interactive, mobile, and multi-sensory tools capable of linking physical place through distance learning, dramatically increasing accessibility via the Internet, and manipulating time through modeling and streaming video technology. The Classroom will teach future teachers the differential use of various technologies in order to identify the best technology for the learning outcomes desired.

A technology-rich teaching environment is more than a classroom filled with computers and other technological devices. We envision a classroom that reflects recent insights into the social nature of learning, and where teaching, learning, and technology are integrated in meaningful ways. We are striving to create a learning environment where innovative technologies are accessible, convenient, familiar, and enable meaningful communication that is otherwise unavailable. Finally, transparent technologies allow the focus to lie more on the content of the learning problem, rather than overtly on the technology that enables the interaction.

The Classroom of the Future is a suite that begins with an experimental classroom and a seminar room, wireless environments that will allow students to be highly mobile yet continuously connected to the interactions and resources they need. Both the seminar room and the experimental classroom will be connected to a group space outfitted with a plasma screen for pre-service teachers to view the instructor's activities (either in the experimental classroom or the seminar room), work on group activities, and share ideas. "Smartboards" will be mounted on the walls of seminar room and the experimental classroom, in which students can record what is written on the boards onto computer files or print the information for use as handouts. Students and faculty will be able to share information from one laptop to the instructor's station, onto the Smartboards, and back to each student's screen seamlessly. Both rooms will have an instructor's station—complete with control system, a sound system, a computer, a VCR, and software for "beaming" and/or receiving data between their computer and the students'. The suite also includes a Macintosh Lab, computer room, office/lab assistant space and computer LAN closets. Since a major obstacle to technology integration lies in education and awareness, graduate assistants will be on hand to assist projects and provide technical support for activities in the suite. Ultimately, the Classroom will provide the necessary environment for education faculty members to model the types of instructional activities that pre-service teachers can incorporate in their future classrooms, and support

creative approaches to curriculum design to forge innovative lessons in new formats or for special types of learners.

A location for the Classroom of the Future has been identified and preliminary remodeling of the space has begun. A sketch of the space below identifies the components of the Classroom of the Future suite:

[insert Steve's sketch here]

An example of how the Classroom of the Future will support innovative curricula design is the LEO EnviroSci Institute, a teacher training initiative that will engage teams of teachers and media specialists from middle and high schools matched with a Lehigh pre-service teacher to develop technology-enriched science curricula. Working with Lehigh scientists and education faculty, the teacher teams will learn environmental science content and actively collect data, analyze data, work with Global Information Systems (GIS) databases, and engage in science-specific pedagogical practices that incorporate Web-based and other technologies to be implemented into the science classrooms. The University plans to have the EnviroSci Institute in place by summer of 2001 and the Classroom of the Future will serve as the support center for the educational technology to be developed by the teacher teams.

The Classroom of the Future will be a \$234,000 project implemented in three major phases. To date, Lehigh has committed \$68,500 toward the Classroom of the Future suite, including \$15,000 for upgrades to its computer lab, \$10,000 for renovations, and \$43,000 toward the experimental classroom and plasma screen. We ask that the George I. Alden Trust consider a grant of \$81,000 to purchase 15 wireless laptop computers, the wireless LAN components, and equipment for the seminar room (budget attached). This level of support will be vital to making the Classroom of the Future available to pre-service teachers as early as the fall of 2000. The University will concurrently seek support from corporations, foundations and friends to purchase the balance of the laptops and associated components by fall of 2001.

### *Why Lehigh?*

A major demonstration facility for educational technology is particularly suited to the strengths and existing offerings of Lehigh's College of Education. The Educational Technology program at Lehigh prepares educators and researchers at the master's and doctorate level in the development of technology-enriched curricula and has received national and international recognition for faculty accomplishments in design, development, and implementation. The master's and doctoral level Technology-Based Teacher Education (TBTE) program emphasizes the effective application of computer technology for teaching and learning, and on how technology, teaching and learning interrelate. The College is a

leading contributor to CaseNET, a web-based pilot program for professional educators and has received major grants to support new initiatives, including a \$670,000 award from the Andrew W. Mellon Foundation this year. The College of Education received \$5.25 million in research grants in 1999 and was one of the most widely published in ISI-indexed education journals. *U.S. News & World Report* ranks Lehigh University 34<sup>th</sup> among all national universities and Lehigh is listed among the "most competitive" colleges in the latest edition of *Barron's Profiles of American Colleges*. The College of Education ranks among the top 50 schools of education in the 2000 listing of "America's Best Graduate Schools" by *U.S. News and World Report*.