NUCLEAR ENGINEERING EDUCATION IN THE FUTURE

H. L. Dodds
IBM Professor and Head
Nuclear Engineering Department
University of Tennessee
Knoxville, Tennessee 37996-2300
Email: hdj@utk.edu

ABSTRACT

The phrase "going to college" may mean something totally new and different in the future. It could mean hooking up your laptop whereever you happen to be and whatever time is convenient for you to perform the next series of lessons for whatever curriculum you have undertaken at your chosen virtual university. This idea may seem somewhat farfetched, but it is happening now. Students may take college courses through distance education which includes videotape (asynchronous communication), live video/audio via high speed transmission lines such as ISDN or TI (synchronous communication), and the current internet which includes both synchronous and asynchronous web-based components.

Electronic distance education in engineering at the University of Tennesse (UT) began over 25 years ago with videotape courses supplemented by telephone calls from students to professors. About ten years ago the UT Nuclear Engineering Dept. presented its nuclear criticality safety courses via live teleconference from Oak Ridge, TN to Portsmouth, OH and Paducah, KY. More recently, we have presented a criticality safety course from the UT main campus in Knoxville, TN to nuclear engineering students at North Carolina State University in Raleigh, NC. While the technology for live real time communication is improving, it is still lacking somewhat in both quality and reliability.

At present, we are using a combination of all distance education mechanisms currently availabe to convert our courses, both undergraduate and graduate, from the traditional on campus classroom presentation to distance education courses. We are just beginning this endeavor and much remains to be done. We would like to offer most of our B.S. nuclear engineering courses to distance students in order to increase our undergraduate enrollment. Laboratory based courses will be the last to convert, but even these courses should eventually be available in a virtual manner.

While many distance education courses will ultimately be available asynchronously, it is my personal opinion that real time interaction between instructors and students will always be a necessary part of some courses in order to have a truly high quality educational experience. Students will miss spontaneous "war stories" and other valuable personal experiences of the instructors if everything is asynchronous. Thus, I prefer to have both, synchronous and asynchronous components, in most engineering courses. The synchronous part for distance students should eventually be like the TV game show "Hollywood Squares" where the instructor sees and hears all of the students, and each student sees and hears all of the other students as well as the instructor in a live real time information exchange. In such an environment, the students may not be able to notice that their instructor has on one blue sock and one brown sock, but then nothing is perfect including distance education.