# A VIRTUAL COMPUTER LAB FOR DISTANCE BIOMEDICAL TECHNOLOGY EDUCATION

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A strategy for creating a virtual computer lab for biomedical technology education and its application are described.  The method, which can be employed with varied videoconferencing software and selected open source desktop sharing tools, was used to provide one of the mini-courses offered by the National Center for Biotechnology Information at a distance.  The mini-course, which was previously only offered face to face, is one of several that entail applying concepts in biochemistry and genetics to search genomic databases and other information sources.  It is highly interactive and involves use of 3D molecular modeling software that can be computationally taxing.  An important goal in offering the course at distance was to provide as much functionality of the computer lab as possible, the venue where it is normally taught, so that students could see demonstrations by the instructor and the instructor could observe the students working at their desktops.  A secondary objective was to record the session for later use on demand.

Videoconferencing over IP was used with varied combinations of desktop sharing software.  The instructor's desktop ran a server enabling it to be accessed by a client on a remote workstation which was projected at the distant site for students to see.  Each student workstation ran similar servers allowing the instructor to use a second computer with a client to access their desktops and provide assistance when problems were encountered.  An operator at the remote projected workstation would simultaneously redirect its client to same student computer so it could be projected for all students to see the assistance that the instructor provided.  Extensive tests were done to find the right combinations of software and data transmission rates that could accommodate real time manipulation of the 3D models and the pilot distance course originating at the National Library of Medicine was conducted with 10 health science faculty at the University of Puerto Rico Medical School.  The pilot course was highly successful, both in terms of the versatility of the technology and student responses to it.

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