# INTEGRATION OF MAJOR RESEARCH INSTRUMENTATION INTO UNDERGRADUATE GEOTECHNICAL ENGINEERING EDUCATION

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In preparing well-trained engineers for this century and beyond, educators must train their students to become efficient information seekers and disseminators. The consequences and implications of recent technological advances cannot be ignored by the educators and should be incorporated into the engineering curricula and programs. Being able to access, interpret, and evaluate relevant technical information in a timely and effective manner is becoming a necessity for all engineers. Understanding the physical meaning of engineering principals and the capability to design and conduct experiments create an advantageous edge. Working together in multidisciplinary groups and conveying information through effective oral and written communications is also essential in today's world. However, these skills are only marginally introduced within most traditional engineering curricula and classrooms.

As in many other disciplines of engineering and science, geotechnical engineering is a dynamic field with a continuously expanding body of knowledge that makes it increasingly difficult for practicing geotechnical engineers to keep up with the latest advances. Recent graduates of engineering programs enter into a working environment that requires highly specialized competencies and a broad understanding of engineering concepts. In order to keep up with newer technological advancements, geotechnical engineering educators must broaden their pedagogical role beyond passing on theoretical and practical knowledge to their students in a traditional classroom setting.

This study examines the potential of Internet-based course modules that utilize major research experimentation facilities on enhancing the traditional geotechnical engineering education. The advanced experimental capabilities and tele-presence tools available at the RPI-NEES geotechnical centrifuge center is integrated within an Internet-based educational environment for geotechnical engineering students at the Tulane and RPI campuses. The proposed work utilizes existing curricula and facilities to provide the students on these campuses with much needed skills. Students are exposed to modern and interactive educational tools that should help improve their understanding of different theoretical engineering concepts. These educational tools include simplified physical modeling, hands on experimental experience, visual observation of the actual response of soil and soil-structure systems, use of instrumentation and acquired data as well as the use of interactive 3D data viewers for analyzing the measured response. Students actively engage in model design, instrumentation, and testing. The students on both campuses also access, interpret, evaluate and exchange relevant technical information via the Internet and video conferencing. Appropriate quantitative instructional measures are employed to evaluate the effectiveness of the proposed course modules and the improvement in the students' performance in order to achieve the most educational benefits.