LIVING WITH THE LAB – BOOSTING EXPERIENTIAL LEARNING AND CREATIVITY IN 1ST YEAR ENGINEERING STUDENTS

DAVID HALL AND MARK BARKER
College of Engineering and Science
Louisiana Tech University
Ruston, Louisiana 71272 USA
Corresponding E-mail: dhall@latech.edu, mbarker@latech.edu

ABSTRACT—During the past three years, the College of Engineering and Science at Louisiana Tech University has offered a robotics-centered sequence of engineering courses to pilot groups of freshman engineering students. The objective of these courses is to immerse the students in a skill based, project driven curriculum that builds creativity and a can-do spirit. Students were equipped with a Parallax BASIC Stamp controller, sensors, servos, and software to provide the basis for a mobile laboratory and design platform. Possession of these robotics kits by individual students (two years) or student teams (one year) provided a mechanism for boosting experiential learning to a level that would be difficult to attain in a fixed university laboratory setting. Using this educational approach, students were able to program, prototype, and debug in their own time and space such that they were effectively “living with the lab.” The robotics content in the course was mixed with traditional freshmen engineering topics such as solid modeling, spreadsheets, teamwork, communication skills and selected engineering fundamentals. The freshman experience culminated in the design of “smart product.” Example products include a musical relaxation fountain, an infrared glove remote control unit, an assistance device for the visually impaired, and the friendly flusher (a smart toilet). These and other products are discussed in the paper along with a description of the course content and the authors’ experiences.