Extending the Next Generation Robot Laboratory to Increase Diversity in Undergraduate CS Programs

Richard Barnes, John Chilton, Maria Gini, Elizabeth Jensen, Maitreyi Nanjanath
Department of Computer Science and Engineering, University of Minnesota

Background

- Two courses: a freshman seminar and the first required course for CS and CE majors (CS1)
- Small seminar (7 students), large CS1 (100-130 students/semester)
- Wide range of skill levels, and attitudes towards computer science
- Mostly freshmen, a few transfer students or students changing career in CS1 course
- Very few women and minorities

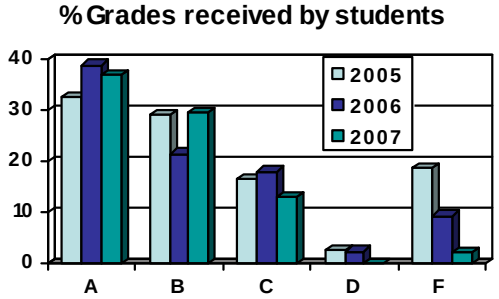
Goal

- To increase student interest and improve grades through active participation and exciting assignments

Intervention, 2nd and 3rd years

- Added in-class activities to improve attendance and participation.
- Added course material on Python to show students how much they have learned and how easy it is to learn a new programming language.
- Added a lab where students work in larger groups to program a robot dog to dance.
- 3rd year only, added an optional project to develop a multi-player game.

Videos of AIBO lab posted on YouTube



Results

- Increased class attendance
- Increased the number of students receiving grades in the A-C range
- Decreased the number of students receiving a D/F

Publications

- Richard Barnes and Maria Gini, Developing a Text-Based MMORPG to Motivate Students in CS1, *AI Education Colloquium*, AAAI, July 2008.
- J. Chilton and M. Gini. Using the AIBOs in a CS1 course. In *AAAI Spring Symposium -- Robots and Robot Venues: resources for AI education*, pp. 24–28, AAAI, Tech Report SS-07-09, 2007.
- M. Gini, J. Pearce, and K. Sutherland. Using the Sony AIBOs to Increase Diversity in Undergraduate CS Programs, in *Proc. of the Conference on Intelligent Autonomous Systems*, IAS-9, Japan (March 2006) pp 1033-1040.
- M. Gini, J. Pearce, and K. Sutherland. Extending the Next Generation Robot Laboratory to Increase Diversity in Undergraduate CS Programs, NSF CCLI Showcase, *SigCSE 2006*, Houston, TX (March 2006).

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