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

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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.

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.
- 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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