Work in Progress - Implementing a Freshman Mentor Program

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Abstract - Creating positive learning communities that engage incoming engineering students with varying degrees of engineering experience poses a challenge to universities with high numbers of enrolled students. Many schools have a general university-wide orientation program for every student. Other universities address only a distinct subset of students in their mentorship programs. Neither solution provides individual technical mentorship to the entire incoming class. In September 2006 a solution was started at OSU which was to implement a mentor program for the entire freshman class. Evaluation tools for the freshman mentor program consist of student retention rate records, a freshman mentor database, and a survey to track growth in our mentoring effectiveness within the student body. Future goals of the program will include: increasing student involvement with academic clubs, implementing novel structures to increase retention.

Key Words - Electrical Engineering, Mentorship, Engineering Education, Freshman, Self Efficacy, Leadership

INTRODUCTION

Mentoring programs are a common solution to retention problems in universities. Scope and approach in these programs is extremely varied. The University of Tennessee implemented a mentor program they call “Engage”. The Engage program combines five basic engineering courses into two team-taught courses. The courses include design teams each of which has an upperclassmen coach. Results from this program have indicated improved retention rates and increased preparedness for students entering their desired major engineering department [1].

The University of Nebraska began a pod-based mentoring program in Fall 2005, which serves as a model for Oregon State University’s mentoring program. Their plan used an off-campus retreat, student support communities called pods, a graduate student Counseling Assistant, and more immediate feedback in an attempt to reduce the attrition rate during the freshman year. The Counseling Assistant led the lab for the students and was successful in influencing students during the weekly laboratory. Their efforts were rewarded and the attrition rate lowered from a historical average of 33% to 20% [2].

FRESHMAN MENTOR PROGRAM

The mentoring approach started at Oregon State University’s Electrical Engineering program in Fall 2006 modifies the program started at University of Nebraska [2]. Four main features have been implemented to suit the needs of a larger student body. First, instead of a single counseling assistant, a freshman mentor coordinator is employed to lead six other undergraduate freshman mentors for the entire year. Second is that mentors are hired to lead a lab section during each of the three terms in the freshman year. Next, mentors are trained to properly interact with different student skill levels. The last criterion is that the mentor program must be self sustainable.

The Freshman Mentor Coordinator is a graduate student that completed his or her undergraduate degree at OSU. The Coordinator then handpicks the other undergraduate mentors, one for each lab section. Each mentor is selected for their ability to serve as a role model for engineering success. Half of the mentors are chosen for engineering passion and lead by example. The other half are outgoing and guide students via positive encouragement and rapport. The ‘chemistry’ of the team is designed for balance.

Each mentor is employed as a lead teaching assistant for a lab section during all three terms of the freshman year. This opportunity to lead a section of 20 students and become involved in student instruction and assessment creates a genuine sense of concern for student retention and development. Mentors also hold weekly office hours in a dedicated room called the Freshman Mentor Lounge. The layout of this room intends to create an open and inviting refuge where students can come eat lunch, talk to their mentors, and receive help with their coursework. A specifically smaller room is used to make a more comfortable atmosphere than a classroom or study hall provides. Lastly, a desktop computer holds a database that is updated with logged information about when student visits happen. Mentor interactions with students are logged, whether due to a lecture, lab, extracurricular, or social question into a mentor database. The information gathered can help in the analysis of course difficulty, because students tend to come to mentors for help as...
coursework becomes more difficult. The mentor database has recorded 304 interactions with 88 of our 176 incoming students.

![Student experience distribution chart](image)

Figure 1: Student experience distribution chart

Varying experience levels within the incoming freshman class present difficulties when mentoring or planning laboratories. The experience levels of incoming freshman can be characterized by a bell curve with three distinct regions. Region 1 represents the students that have no prior electronics experience. Region 2 is the largest group and has students with little or moderate electronics experience. Region 3 has students with electronics experience. A static lab can only target a specific portion of this distribution, and typically labs are formed with an expectation that every student can finish the lab in an allocated amount of time. Students from the third region find these static labs to lack innovation and excitement, and often complain about the labs being “too easy”. Students from the first region contrarily find the labs “too difficult” and are required, in some cases, to play “catch-up” with the rest of the students. The solution is to employ a dynamic, project-based lab which can add extra challenges to exceptional students, adjusting the difficulty of each project to suit the needs of each student. The freshman mentor is used to add this dynamic dimension to the labs. These dynamic labs improve the retention and development of students in all three regions of the student body.

Sustainability within the mentor program is key to its continuation. Hiring appropriate undergraduates that have already completed their freshman courses as peer mentors creates natural learning communities within the incoming student body. Mentors quickly become role models for the students as shown by a survey given to the students during the beginning of every term. As mentor positions become available they are advertised, and current mentors encourage appropriate students to apply. After the applications have been received, the Mentors are then asked who they think best fits as a Freshman Mentor for the following year. Mentors are ideally suited for this task because they have known the students for an entire year and best know the requirements to become a future mentor.

**MENTOR EMPOWERMENT**

Freshman Mentors are encouraged to create activities and groups to help improve student involvement, camaraderie, and interest in electrical engineering. Video game tournaments, study sessions, outdoor games, extra lab time, and other activities have been created by the mentors in efforts to better connect to the students and streamline operation of the freshman year courses.

A direct result of this encouragement is the new OSU Robotics Club. This club was founded by the Freshman Mentor Coordinator, and three other freshman mentors quickly became involved. Student involvement has already increased and there are currently 45 members involved in the club.

**RESULTS**

A voluntary anonymous survey is given to students once a term during their freshman year. Students are asked to rate the accuracy of a list of statements on a scale from 0 to 100. Preliminary results have been very positive. Students rated the question “I have a role model who helped me engineer something creative this term” at an average of 22.0 during the beginning of the first term. By the end of the second trimester the average rating rose to 52.2.

**CONCLUSION**

This mentoring program has been a valuable resource with the execution of labs during the term. Students enjoy the consistency of the mentor role models. This program has become a valuable asset in gaining the ability to develop students of all incoming experience levels. Overall student enjoyment of the labs themselves has also increased as student initiated projects and innovations have become commonplace in and outside the lab.

**FUTURE WORK**

Future ideas for the mentoring program includes creating new student involvement structures, such as student competitions, innovation challenges, engineering workshops, or community building activities.

**REFERENCES**
