Work in Progress - Adopt a School - The Foundation of a Long-Term Outreach Effort

Chad D. Mano and Vicki Allan
Utah State University, chad.mano@usu.edu, vicki.allan@usu.edu

Abstract – A glaring problem in undergraduate computer science programs is the lack of females and members of certain ethnic minority groups. This problem is compounded by the fact that many faculty members and departments are unable to devote much time or financial resources towards outreach efforts. This paper presents a model for a long-term outreach effort that is enabled by “adopting” a local K-8 School. This model enables a department to participate in effective outreach activities with a minimal time commitment. Additionally, this model provides tremendous educational and financial benefits to the partner school with little, if any, financial obligation on the part of the sponsoring department. While the scope of this project is relatively small compared to many outreach efforts, it is appropriate for departments that lack the time or financial means to launch a large-scale program.

Index Terms – STEM outreach, service learning, community building, computing education.

INTRODUCTION

A glaring problem in the computing field today is the lack of females and members of certain ethnic minority groups. While it is important to address this problem at an industry-level, academia must also do its part in encouraging students from these underrepresented groups to pursue computing degrees and careers.

We expect that a large population of computing science departments are similar to ours, in that we want to contribute to solving the diversity problem, but lack the time to do so. In a research university faculty members are typically assessed on their ability to produce technical research in a specific area. This leaves little time for outreach activities that may contribute only marginally to the assessment of the production of the faculty member. In a teaching university or college, the course load often leaves little time to pursue other activities.

An additional limitation on establishing an outreach program is the lack of financial support. Without budgetary statistics to backup our claim, we feel we can safely assume that most departments have more needs and wants than the resources to provide them. Thus, even if a department wanted to create a program, such as a summer computing camp for girls, it would probably be well below other items on the department’s priority list. This paper presents our approach to outreach taking into consideration the limitation of time and money.

RELATED WORK

The literature shows a number of studies that investigate the reasons behind the diversity problem (especially among females) in computing [1]-[3], as well as studies that assess programs designed to curtail the problem [4]-[5]. Studies such as these are invaluable resources in designing and establishing a departmental outreach effort.

Technology-related fields continue to expand, providing new and interesting career opportunities for our graduates. In fact, of the top ten fastest growing professions, five are computer related [6]. However, interest in CS fell by 80% between 1998 and 2004, and has dropped 93% since the 1982 peak of CS majors nationwide [7]. Unlike many fields where the representation of women has increased over time, computer science has experienced declines in the proportion of female graduates. In order to match future demands for information technology, we need to increase the participation of both men and women. Increasing diversity enhances the breadth of understanding in leadership positions, gives a different perspective in the marketplace, increases creativity, and improves problem solving, particularly in team situations [6].

Of particular interest to us is the issue of negative perceptions towards computing that are formed in the pre-High School years among females [8]-[10]. While outreach is important at all levels, this indicates that the pre-High School years are a critical time where perhaps the greatest fundamental change in how computing studies and careers are viewed can be altered.

BARRIERS

There are a number of barriers and limitations that may be encountered in establishing an outreach program. The following are three important issues our program addresses:

I. Time Limitations

The amount of time available for faculty members to spend on outreach is very limited. Thus, it is vital that participating faculty members can contribute time that is effective, but minimal. Effective, in this case, means time that is spent actually interacting with students, rather than planning or recruiting students to participate.

II. Financial Limitations

978-1-4244-1970-8/08/$25.00 ©2008 IEEE
October 22 – 25, 2008, Saratoga Springs, NY
38th ASEE/IEEE Frontiers in Education Conference
S2D-7
Without the benefit of a grant or other source of funding, options are limited as to what type of outreach program can be instituted. A summer computing camp program may sound appealing, but is probably infeasible for most departments to fund. Sponsors and other donations can be sought after, but this is not a simple task, potentially requiring a significant amount of time and effort to procure.

III. Gaining Participants

An effective outreach program must obviously target students who would otherwise not be interested in computing due to lack of awareness or knowledge of the subject. Promoting a program may only serve to attract students already interested in computing.

Taking into consideration the time and financial limitations, gaining participants may appear to be an overly difficult obstacle. Even disregarding financial constraints, it is very undesirable to spend a large amount of the limited time available on “overhead” activities rather than face-to-face interactions.

ADOPT-A-SCHOOL MODEL

In accordance with the limitations and barriers presented, the ideal outreach program is essentially one that takes little time, little or no money, and already has students ready to participate. Despite this seemingly ludicrous description of an outreach program, these are not impossible characteristics to achieve without sacrificing effectiveness and impact.

The adopt-a-school model is centered on establishing a relationship with a local primary or secondary school. This approach provides a number of benefits including making it possible to overcome the limitations placed on the program.

More formally, the model is a long-term partnership between a university department and pre-college school at an administrative and a classroom level. The administrative support is important to foster a mutually beneficial program, while the actual face-to-face interaction takes place in the classroom.

An outreach program founded on a relationship with a single school might be considered to have too narrow a scope. We certainly agree with the assessment of the narrow view, but contend that the positive impact we can make on a personal level warrants the continued pursuit of this program. Additionally, this effort will potentially directly benefit our department in years to come.

The following is a general overview of the outreach program model:

- Partner with a local school, preferably pre-High School
- Present periodic outreach activities as part of the regular computer class curriculum
- Recruit undergraduate and graduate students to volunteer as helpers for activities
- Invite campus computer club groups to organize special outreach events

- Encourage majors looking for course/senior/M.S. projects to develop tools that can be used for outreach efforts
- Keep track of students so for future assessment and recruiting purposes

In establishing our outreach laboratory we were able to provide an incentive to our partner school by offering to outfit a computer laboratory. We did this without any financial output or loss by retaining control of 3-year old systems that were being swapped out of a department computer lab. These systems are typically “donated” to other departments or sent to surplus, thus, they do not have real financial value to the department.

CURRENT STATUS AND FUTURE OUTLOOK

We were able to complete a number of in-class activities during the recent school year, all of which were very well received by the students. The first year-end survey of students has just been completed and will soon be analyzed in order to improve the program for next year.

Our program is in its infancy, but we are excited at the results and promise of a long-term relationship with our partner school. While this first year required some overhead time in planning, the vast majority of time spent was face-to-face with the young students. Additionally, we accomplished this without any financial output from the department.

REFERENCES