CS Recruiting Program for Undergraduates

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Abstract

Computer science is one of the nationally recognized critical fields that has made the least improvement in producing women and minority graduates over the last decade. Nationwide, in 2001, only 27.6 percent of all awarded bachelor degrees went to women, and even fewer went to the separate minority groups. As society's need for technology grows, so does the industry's need for more diversely qualified computer scientists. The Texas Engineering and Technical Consortium (TETC) and the National Science Foundation (NSF) both recognize the critical shortage of computer science undergraduates and have provided funds to improve the situation through Texas A&M University – Corpus Christi (A&M-CC) faculty and student involvement. The TETC and NSF grants have the objective of helping universities recruit, retain, and increase the number of computer science graduates. Both organizations also have a second goal of equal significance – increase the number of females and minority students in the field of computer science. As a recipient of these grants, A&M-CC developed and implemented a computer science recruiting program, using current undergraduate students, and one graduate student, to help in the University's computer science recruiting efforts. In September 2003, the planning began with the NSF grant to determine the best approach for recruiting and targeting females and minority students and raising their interest in attending college and majoring in technology related fields. In early 2004, the TETC grant was added to enhance the ongoing efforts. A&M-CC designed their recruiting program using the "Best Practices" for recruiting underrepresented minorities. This is a technique used by some of the nation's most successful engineering schools for producing minority graduates. This paper describes the details of the implementation of the recruiting program and the results that have been achieved so far.

Background Facts

"By avoiding computers, women [and minorities] may be missing out on the generous salaries and abundant career opportunities in information technology."[1] Texas A&M University – Corpus Christi (A&M-CC) in partnership with the Nation Science Foundation (NSF) and Texas Engineering and Technical Consortium (TETC) is trying to combat the shortage of women and minorities in computer science. This shortage is seen nationwide, and in 2001, 3.4 percent of all conferred undergraduate degrees were

awarded in Computer Science. Of the computer science degrees, 56.7 percent went to Caucasians, 14.6 percent went to Asian/Pacific Islanders, 9.9 percent went to Blacks, 5.5 percent went to Hispanic, 0.6 percent went to American Indian/Alaskan Native, and 4.8 percent went to unknowns. Overall, females received only 27.6 percent of computer science degrees.[2]

Goals

Strategies and programs for recruiting and retaining underrepresented minorities cannot be separated. Rather, they consist of a gamut of both objectives and strategies.[3] Like Utah State University, A&M-CC has two main goals for the undergraduate computer science recruiting program. The first goal is to familiarize high school students (largely those from Corpus Christi and the surrounding area) with A&M-CC, and persuade them to consider attending the university, and the second is to increase their interest in pursuing a degree in Computer Science.[4] Through active recruiting methods, A&M-CC attempts to recruit and increase the number of students in the computer science program, especially students who are underrepresented minorities and women.

How the Program Started

With funding received from the National Science Foundation, the computer science recruiting efforts began in September 2003. The first initiative taken was the hiring of a graduate student who would work closely with the computer science professors of A&M-CC to develop and implement a recruiting strategy. The primary focus of the graduate student was to oversee and coordinate the activities and events of the undergraduate computer science recruiting team. The graduate student would also be responsible for interviewing applicants, training the recruiters, and would act as a liaison between the A&M-CC professors and the recruiting team. In order for prospective students to be able to relate with the A&M-CC computer science recruiters, the recruiters had to best represent the culture of South Texas. By the end of October, a total of six undergraduate computer science students were hired. The diversity of these individuals was not only seen on the outside, as these students ranged in age, social and economic backgrounds, ethnicity, and gender, but also varied in the different avenues they were pursuing with their computer science degrees. They ranged from the typical aspiring computer programmer to the more unique off-beat graphic arts designer. These undergraduates assigned a face to computer science most people never thought of. Finally, with some help from the TETC grant in January 2004, three more recruiters were added to the recruiting team.

Tools for Success

Once the recruiting team was hired, they began brainstorming the best way to deliver the information and facts to the prospective students and parents. One of the first tools developed was an undergraduate computer science brochure. The pictures for the brochure were shot by the university photographer using current A&M-CC computer

science students in and around the campus. After numerous photos were taken, a selection made on those that would make it into the brochure. Finally, all the photos were taken to the university's publisher, where the brochure was laid out and designed for publication. The brochure contained information about A&M-CC's computer science department, as well as listing several classes offered, and the contact information one needs to be able to contact different areas of the computer science department. The brochure can be viewed online by following the address below, although it does require the use of Adobe Acrobat http://www.sci.tamucc.edu/~csrecruiting/images/Brochure-web.pdf .

A PowerPoint presentation was also created, to aid the recruiters in conveying important information about A&M-CC as well as information on the computer science program offerings. When the recruiting team is off campus visiting prospective students, this PowerPoint presentation allows students to see different pictures of the campus and ask questions over the information presented.

In early December, the recruiting team began designing and implementing a Website, designed to target those students who they would be unable to reach. The Website can be viewed at http://www.sci.tamucc.edu/~csrecruiting/ and allows students and parents to read some answers to frequently asked questions, meet the recruiters (past and present), as well as send the recruiting team questions and comments. Although the website was designed and created for prospective undergraduate students, the recruiting team has found that numerous prospective graduate students have been using it as a source for knowledge. The Website is continuously updated, with new information and places the team is headed to visit. It also allows for people to request a visit from the team, by filling out a simple form and submitting it.

In January, with the addition of three more recruiters, from the TETC grant, the team was able to design a display/presentation board to be used at various recruiting events, such as Island Days and College Fairs. The team was also able to build a robot using Lego Mindstorms, that they could take with them to grab the attention of prospective students, and get the chance to talk with them to explain the computer science behind the robot. Finally with help from A&M-CC's general recruiting program, the CS recruiters were able to make follow-up phone calls with prospective students they had previously visited. During these phone calls, the prospective student was given the opportunity to ask the recruiter questions they might have thought of, and the recruiter attempted to evaluate the student's potential of attending A&M-CC.

Ready to Go

A&M-CC designed their recruiting program using the "Best Practices" developed by the US Coast Guard Academy, for recruiting underrepresented minorities. This is a technique used by some of the most successful engineering schools for producing minority graduates in the nation. Modeling their recruiting after Georgia Tech, Rensselaer Polytechnic Institute and Colorado School of Mines, A&M-CC sought to use recruiting means that are direct, high touch, and multifaceted.[3]

"Direct means the school has established, or seeks to establish, in-house capabilities to network within the minority community and to identify its own prospects." This networking is done by establishing relationships with pre-college programs, junior colleges, and high schools. [3] At A&M-CC the computer science recruiters sought to establish these relationships and network through an office coordinator. It was the coordinator's job to notify the local high schools about the new recruiting program, and to schedule events with the different high schools. The coordinator was also responsible for building relationships and networking within the university.

"High touch means these schools employ regular, often monthly, personal and personalized communications with prospects and their families to transmit a conviction that the prospect is wanted." [3] Through the recruiter's follow-up phone calls, the prospective student was able to receive one-on-one time talking with the recruiter. Often times, parents would also utilize this opportunity to talk with the recruiter to ask questions about the university and the computer science program. The prospective student and family was then invited to visit the campus, and to contact us should they have any further questions.

"Multifaceted means these schools employ multiple recruiting strategies including: campus visits for prospects and parents, recruiting parents as well as prospects…and programs for middle and high school students…with minority-intensive high schools. [3]"

The recruiting team, in cooperation with the university, began to participate at Island Day Fair, a university sanctioned event where interested high school students come visit the university. At Island Day Fair, the recruiting team and several computer science faculty members use two tables on which they display pictures of students, information about computer science and A&M-CC's computer science program. During this time, prospective students and inquiring parents get to walk around asking question and collecting hand out information they can take home. After the fair, the recruiting team has an opportunity to eat lunch and share their personal experiences with the prospective students and parents.

Students Galore

The recruiters had a variety of opportunities to talk with many students of all ages and of very diverse backgrounds. November 2003, the recruiters started visiting high schools and continued visits until April 2004. The following chart shows the numbers and types of students the recruiters visited.

High School Name	Date	Number of Students	Girls	Boys	Hispanics	African Americans	Asians Asians
Roy Miller	Nov. 2003	149	0	0	117	13	0
King	Nov. 2003	98	12	86	35	3	3
Carroll	Dec. 2003	16	6	10	2	0	0
Flour Bluff	Feb. 2004	45	1	44	11	5	1
West Oso	Feb. 2004	10	3	7	10	0	0
Alice	Feb. 2004	43	3	40	37	0	0

Moody	Mar. 2004	188	67	121	168	8	0
Aransas Pass	Mar. 2004	126	45	81	53	2	0
Odem	Mar. 2004	242	72	80	149	0	0
Sinton	Apr. 2004	222	115	117	171	19	0
Taft	Apr. 2004	30	12	18	30	0	0
Totals		**1169**	**336**	**604**	**783**	**50**	**4**

Also, through out the fall semester, and the beginning of January, the recruiters, in participation with A&M-CC, hosted Gear-up programs. Gear-ups gave the recruiters a chance to reach a younger age group, and inform them about the benefits of college, and encouraged them to start thinking about college at their age. The following chart shows the students the recruiters were able to reach through the Gear-up program.

Gear-Up Schools	Date	Number of Students	Girls	Boys	Hispanics	African Americans	Asians
Roy Miller	Oct 2003	8	0	0	7	0	0
Robstown	Nov 2003	30	14	16	24	2	0
Alice	Fall 2003	30	10	20	0	0	0
Martin	Dec 2003	53	21	32	53	0	0
William Adams	Jan 2004	60	0	0	0	0	0
Totals		**181**	**45**	**68**	**84**	**2**	**0**

Problems Encountered

The main challenge the recruiters faced was that the majority of high school students and parents do not know what computer science involves.[5] "This can partly be traced to the fact that most high school computing courses are heavily biased toward computer literacy."[5] Through the recruiters' combination of the computer science major and what they will be pursuing after college, it was hoped the prospective students would realize there are "multiple ways to 'be in' computer science", and that computer science is an enabling discipline, in that it teaches skills that can be applied to many fields."[1]

Another challenge realized by the recruiters after the first couple visits to high schools is, the PowerPoint presentation originally designed was not effectively connecting with the high school students. The recruiting team had designed the PowerPoint presentation assuming the majority of students they would be talking to were college bound, and the team would only be influencing the student's possible choice of majors. However, it was discovered about roughly one-third of the students in each high school class were not even thinking about or planning to go to college. The recruiting team had to now come up with new facts and a new type of presentation to influence the students to think about the possibility of continuing their education and going on to college. New slides were added to the presentation to included information comparing salaries of different education levels, as well as the benefits one would gain by continuing their education. Also more information was added on how students could afford a higher education, through such programs as federal work study, grants, loans, and internships (highlighting some of the places current and past A&M-CC students have worked).

Outside of the recruiting visits, the recruiting office coordinator had difficulties scheduling and coordinating high school visits for the recruiters. High school teachers unfortunately do not get as much office time as a college professor and therefore, are not always near a phone. Numerous messages had to be left for the teachers, and follow-up phone calls and e-mails were a necessity to schedule visits, often times leading to a gap between initial contact and actual visit because of communication time.

Future Goals

The recruiters hope to soon host visits to the computer science department, where the prospective high school students can visit the university, meet faculty, and see actual computer labs. This will bring to life what a university atmosphere feels like, and hopefully allow the high school students to actually envision themselves one day sitting in the computer lab listening to a professor.

Another goal of the recruiters is to develop new ways to present information in an exciting manner that will engage students of all disciplines. This will allow for students who have interest as well as those who have never thought about computer science to experience computer science at a basic level. Through the new presentation of material, hopefully all students will gain the knowledge of how widely spread computer science is, and how it affects our daily lives.

Finally, they hope to expand the recruiting area beyond the Corpus Christi region, and also begin to visit middle and junior high school students. This will enable the recruiters to be able to reach a wider variety of students and expose them to computer science. The visits will also encourage younger students to begin thinking about their future.

Conclusion

This paper has described the implementation and results of A&M-CC's Computer Science recruiting efforts. The initial set-up of the recruiting program, the tools needed to create a successful program, and the future goals of the computer science recruiting program were presented. The impact the recruiters are having on the high school students is unclear at this time. But it seems obvious that the people collected at any moment in time will shape the nature and outcome of the collaborations and influence others, not only by their intelligence and creativity but also by their backgrounds.[6] If the high school students can see themselves as a future college student, and possibly even a future computer scientist, then the recruiters have successfully conveyed their message.

Without help from the National Science Foundation and Texas Engineering and Technical Consortium, Texas A&M University – Corpus Christi's computer science recruiting efforts would not have been possible. It is important to remember, diversity does not happen in a year, or by only one institution, and "excellence is not limited to a single race, gender, ethnic group, religion or sexual orientation".[6]

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