Innovations in Pre-College Outreach: Scouts Explorer Posts

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Abstract

Public information indicates that fewer American youth are selecting science and engineering as desired careers. General discussions with underrepresented populations revealed that most students view mathematics and science as very difficult subjects that require a lot of time and hard work to achieve above passing grades. As underrepresented populations become the majority in Texas and other midwestern states, innovative approaches must be developed to excite and encourage high school students to consider science and mathematics as primary building blocks for the future. The Prairie View A&M University (PVAMU) NASA Center for Applied Radiation Research (CARR) adopted the concept of teaming with The Boy Scouts of America to establish joint Explorer Posts with local high schools as a primary component of outreach. The university and high school Math, Science or Environmental Clubs conduct various activities to excite and encourage middle and high school students to do their best in science and mathematics. The Boy Scouts of America insures each member, thus the university does not incur added liabilities. At the university level, the students get a greater vision of how our country, globe and universe are connected though various forms of science (environment) and mathematics (money). Selected activities and benefits are the primary topics of discussion.

Background

PVAMU is a Historically Black College or University (HBCU) located in a rural community approximately 50 miles northwest of Houston, Texas. As a HBCU, its mission is to serve underrepresented populations, which are often economically disadvantaged also. Recent data published by the PVAMU Office of Institutional Effectiveness, Research and Analysis documented that the undergraduate student population receiving some form of financial aid was between 85 percent and 95 percent, during the fall semesters of 1998, 1999 and 2000.[1] The overall undergraduate population was 5,020, 5,147 and 5,382 for 1998, 1999 and 2000, respectively.[2] The African American population is approximately 88 percent and the White/Non-Hispanic is approximately 7 percent. The Hispanic population is, on the average, 2 percent annually. On the national level, African Americans and Hispanics combine for approximately 25 percent of the undergraduate degrees awarded in science and engineering.[3] Additional information published by the National Science Foundation indicates that HBCUs produce 30 percent of engineering degrees (for undergraduate Black students), 44 percent of their natural science degrees, and 25 percent of their social science degrees. These degrees have remained relatively stable for the past 20 years.[4] The goal is to increase the number of American citizens who pursue degrees in science, mathematics, engineering and technology (SMET) disciplines.

Student Input from Local High Schools

Students from several high schools within a 35-mile radius of PVAMU were generally polled to find out why enrollment in college preparatory courses in science and mathematics was low. The most popular responses were:

- The courses were too difficult
- The courses took up too much time
- The courses were dull and boring
- There was no excitement in mathematics
- Students were not motivated or thought college was not for them

Such responses motivated the staff of the PVAMU NASA CARR to seek innovative methods to excite, motivate and encourage middle and high school students to consider SMET disciplines as possible career choices. In addition, NASA and NSF strongly encourage participation from minorities and underrepresented populations to help close the diversity gap of the national workforce.

Joint Explorer Posts

The CARR director and the local Boy Scouts of America representative developed the concept of establishing a joint Explorer Post, with sponsors from the high school and the university, to involve more high school students in mathematics and science related activities. The Post established partnerships between the university and the high school math, science or environmental clubs. The benefits realized by of the partnerships were noteworthy.

- University uses outreach funds to assist in establishing and maintaining the Post
- University outreach funds are also used to sponsor educational enrichment activities which introduce students to real world applications of science, mathematics and engineering
- Additional financial support from the university provides greater opportunities for student participation, which is often discouraged by a lack of funds
- High school principals support more activities which do not extend the financial burden of the student or school
- Teachers have more leverage when it is possible to state, " The university will pay for it, if we provide bus transportation – plus, the students are insured under the umbrella of The Boy Scouts of America"
- University officials are willing to sponsor more activities when the liability for injury rests with an outside entity
- An Explorer Post has access to all scout facilities
- Discounts of often provided to scouts and other student organizations

Educational Enrichment Activities

The impetus of this innovative approach is to excite and motivate more students to have interest

in science and mathematics and to consider pursuing a SMET discipline as a career. The added benefit is that, hopefully, the student will decide to attend college during middle school or earlier in high school and enroll in the college preparatory courses. The most popular education enrichment activities are provided for consideration.

- Visits to College Research Laboratories: Students get excited when they understand the real world problems being pursued in a college research center or laboratory. The equipment is fascinating and the ability to determine or derive so many hypotheses often motivates their interest. It's more than just another field trip.
- Visits to Space Center Houston and NASA facilities: Students are fascinated with the opportunity to walk around in a mock-up of the Space Shuttle. The touch and feel of the components, devices and systems, which have been to space or are designed for space travel strikes greater interest. The opportunity to view the actual mission control room used to manage the operations of a real space mission is something to talk about.
- Beach Clean up: Beach clean up is a nation event managed by the National Parks and Wildlife organization. It sounds like work and the students look forward to it each year. The park director explains how each item found on the beach must be listed in a specific category on a data card. The data cards are collected and sent to the national office in Washington, DC for analysis. As part of a large research project, students take the task very seriously.

Conclusions

The Explorer Post project has become very popular. The trips to Space Center Houston have grown from one almost full bus to two very full busses from three different high schools. We plan to add another high school each year. More students are participating in visits to the college research laboratories and several schools have instituted the visit as an annual event. The concept continues to introduce more and more middle and secondary school students to advanced applications of science and mathematics.

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[1] "Prairie View A&M University 1995-2000 Fact Book."
[2] "View A&M University 1995-2000 Fact Book."
[3] "Science and Engineering Degrees, by Race Ethnicity of Recipients": 1990 – 98, Division of Science Resources Studies, Directorate for Social, Behavioral, and Economic Sciences, National Science Foundation.
[4] "NSF 2000a, p.4-10.

Biography

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