AC 2011-2660: PROGRESS AND IMPACT OF SET: AN NSF S-STEM SCHOLARSHIP PROJECT

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Progress and Impact of SET: An NSF S-STEM Scholarship Project

Abstract:

The State University of New York (SUNY) at Canton received NSF S-STEM grant award for $600,000 over a period of four years to establish Scholarship for Engineering Technology (SET) in the northern New York State known as the North Country. This paper presents the progress and impact of this scholarship on the institution, its school of engineering technology and the community. Eighteen scholars who are academically talented and financially disadvantage will be able to attend two and four year college with most of their tuition and fees paid for. Annual scholarships of $7,200 per student for four years will enable eighteen scholars pursue baccalaureate degree or enrolled in two year associate degree program in Engineering Technology. Scholars may minor in physics or mathematics. Effort was made to attract academically talented high school students meeting scholarship requirements. The selection process placed emphasis on financial needs, underrepresented groups and women. The scholars are supported academically and socially to enable them succeed. Assessment and evaluation of the S-STEM project is an on-going process. The impact on students progress, departments and disciplines involved as well as the institution are being assessed through quantitative (measurable) and qualitative (observation, interviewing) measures to see if progress is made toward achieving its goals.

Introduction:

SUNY Canton is a public, co-educational, technological college with current student population at 3500 and located on a spacious campus along the banks of the Grasse River. Its northern location places it close to the Adirondack Mountains, the St. Lawrence River, and major Canadian cities such as Ottawa and Montreal.

Statistics from the college’s information data and enrollment show that in the fall of 2007, student enrollment shows 52 percent females and 48 percent males. But the school of engineering technology, one of the four schools in the college has 8.5 percent females and 91.5 percent males. Also, only 6 percent of the students in the school of engineering technology are from underrepresented groups. This is a pure indication that fewer women and minority choose careers in engineering and technology. Women have been traditionally underrepresented in science and engineering. Ethnic minorities are also traditionally underrepresented in science and engineering. According to the US Code – Section 1067: Congressional Findings, “As the Nation’s population becomes more diverse, it is important that the educational and training needs of all Americans are met; underrepresentation of minorities in science and technological fields diminishes our Nation’s competitiveness by impairing the quantity of well prepared scientists, engineers, and technical experts in these fields.” In the book Talking About Leaving, Why Undergraduates Leave the Sciences, nationally 40 percent of undergraduate students leave engineering programs, and the losses are disproportionately greater among women and minorities.

This proposal was submitted to the NSF S-STEM (Scholarships in Science,
Technology, Engineering, and Mathematics) program and was declined on the first submission but funded on the second submission in the following year (2009) for $600,000 over 4 years. This paper will present the significance of the SET program, recruiting strategies developed, students support services to enable them succeed, and assessment instruments developed to evaluate the program’s accomplishments.

Significance of the SET S-STEM Project to the Region:

SUNY Canton is located in St. Lawrence County; one of the counties in the economically depressed region of rural northern New York State, often referred to as the North Country. The county is bordered by the St. Lawrence River and Canada to the north and the Adirondack Park to the south and east. The region is home for St. Regis Mohawk Tribe. More than 60% of the students are from the North Country. Some of the local school districts in the North Country are designated by New York State’s Board of Regents as Low Resource/High Need Districts. High need is demonstrated by the following:
1) The percentage of families living below poverty level. The 2006-2007 US Department of Education guidelines indicates that $30,000 is 150 percent below poverty level for a family of four. Table 1 shows the percentage of North Country area families living below 150 percent of the poverty level.
2) Median family income in this region is significantly lower than that for New York State and for the United States. See Table 1.

Table 1: Percentage of North Country Area Families Living Below 150% of the Poverty Level and Median Family Income

<table>
<thead>
<tr>
<th>Geographic Area</th>
<th>Percent of Families at or below $30,000 per year</th>
<th>2005 Median Family Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Lawrence County</td>
<td>42% (^1)</td>
<td>$44,694 (^1)</td>
</tr>
<tr>
<td>Franklin County</td>
<td>Not Available (^8)</td>
<td>$39,287 (^8)</td>
</tr>
<tr>
<td>Lewis County</td>
<td>Not Available (^8)</td>
<td>$38,472 (^8)</td>
</tr>
<tr>
<td>New York State</td>
<td>32% (^1)</td>
<td>$59,686 (^1)</td>
</tr>
<tr>
<td>United States</td>
<td>33% (^1)</td>
<td>$55,832 (^1)</td>
</tr>
</tbody>
</table>

3) Adults in these regions have low levels of educational attainment than the levels for New York State and the United States. While the number of adults age 25 or older with bachelor’s degree is 17.9 percent within New York State, less than 3.3 % of St. Regis Mohawk Tribe (Akwesasne, Franklin County) adults over age 25 hold a bachelor’s degree. In St. Lawrence County, 9.9 percent of adults age 25 or above hold a bachelor’s degree. Generally speaking, students in these regions have (1) few family role models who have attained education beyond high school; (2) do not have access to necessary information, family support, or the understanding of the processes related to attaining postsecondary success; (3) have parents who generally have little or no experience in postsecondary education with little expectation for this
type of educational attainment for themselves or their children. This NSF sponsored SET project will without doubt enable our institution meet some of the local needs of the region and provide services that will enable the scholars attain college degree.

**Recruitment Strategies:**

One of the goals of the project is to increase the recruitment of women (ethnic and non-ethnic) and minority students in the School of Engineering Technology programs affected by this project. The SET management team members developed supplemental recruitment plan which includes the following: 1) Visit local and regional schools with high record of underrepresented groups, 2) Visit community colleges in the area, 3) Discuss and distribute S-STEM information during all Open House activities at the college, 4) Discuss and distribute S-STEM information during Women in Engineering day at the college, 5) Make S-STEM information available on the college website, 6) Design flyers and make it available at various placed on campus. Table 2 below shows some of the regional and local school districts visited and their demographic information which include total enrollment for the school districts, ethnicity, and percentage of students eligible for free and reduced-priced lunch; also included is the high school graduation rates for the academic year 2007 – 2008. Salmon River School District has high percentage of Native Americans.

**Table 2: 2007-2008 Data Showing Sample of North Country School District Enrollment, Percentage of Students Eligible for Free and Reduced-Price Lunch, Ethnicity and Graduation Rate.**

|--------------------------|---------------|-------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------|
| Salmon River Central (Franklin County) | 1471         | 33% Whites  
66% Indian Americans  
1% Blacks |
| Indian River Central (Jefferson County) | 3639         | 77% Whites  
12% Blacks  
7% Hispanics  
2% Asians  
2% Indian Americans |
| Hermon-Dekalb Central (St. Lawrence County) | 374        | 95% Whites  
3% Blacks  
1% Hispanics  
1% Indian Americans |
| Canton Central (St. Lawrence County) | 1342         | 95% Whites  
1% Blacks  
2% Hispanics  
1% Indian Americans  
1% Asians |
| Edwards-Knox Central (St.          | 608          | 98% Whites  
1% Hispanics |

**Selection Criteria**

Students were selected based on the following: 1) Citizen or Permanent Resident of the United States, 2) Must be admitted at SUNY Canton Canino School of Engineering Technology in a four year program or in a two year program, but plans to transfer into Bachelor’s degree; students may minor in physics or mathematics, 3) Must demonstrate academic potential evidence by documentation such as transcript showing Grade Point Average (GPA) of 3.0 or better or high school records (Regent exam scores of 80 or above) and above average in standardized tests (ACT and SAT) for incoming students, 4) Should be financially disadvantaged and must provide documentation such as signed tax form, social services documentation, or other legal document, 5) Two recommendation letters will be required, 6) Must write an essay requiring not less than 500 typed words. The essay will be about their life, accomplishments, and the future they would like to build for themselves, family and community, 7) Underrepresented groups and women meeting criteria are sort and given preference.

**Set Support Services and Programs**

Support programs and services were developed in addition to utilizing the existing programs at the college. The programs and services developed were designed to enhance student learning, confidence, performance, retention to graduation. The new support programs that were developed include: (1) Mentoring Program. (2) Engineering Technology Tutoring Center. (3) Saturday Supplemental Instruction Program. (4) Summer Program in Physics and Math. (5) STEM seminar. (6) Monthly Socials. (7) Field trip for S-STEM scholars.

**Assessment**

Assessment and evaluation of the S-STEM project at SUNY Canton will be an on-going process. The impact on students progress, departments and disciplines involved as well as the institution will be assessed through quantitative (measureable) and qualitative (observation, interviewing) measures to see if progress is made toward achieving its goals. Three areas have been identified for assessment:

(1) Scholars’ progress. Scholars’ progress toward reaching the goals of this project will be measured quantitatively using the following: (a) Academic improvement from performance data such as semester GPA and cumulative GPA; (b) Retention of students in the disciplines and department. (c) Graduation rates of students’ and enrollment into graduate school or work force will be kept; (d) S-STEM scholars contact information will be kept after graduation to track their career achievements.

(2) Effectiveness of the students’ support services. Effectiveness of the students’ support service programs will be evaluated using evaluative process measures. (a) Evaluations will be administered following each component of the services students receive in the form of survey and will be used to assess the impact on the students. The scholars who received the services
will be asked survey questions such as: what did you like about this program? What worked well? How can we improve? The results of this survey will be categorized and tabulated.

(3) Effectiveness of the personnel delivery the services. The personnel delivery services will be evaluated by the Director and members of the management team and will be descriptive.

Conclusions:

This paper is a presentation of an overview of the work and progress of SUNY Canton NSF supported S-STEM project for SET whose goal is to enable academically talented, financially needy students to pursue college degree in Engineering Technology.

Acknowledgement:

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Bibliography:


[8] U.S. Census Bureau 2000, Profile of Selected Social Characteristics (Populations under 65,000 are not surveyed in between national census per Jim Murphy, Economic Development Specialist at SUNY Plattsburgh, October 19, 2006).