Increasing STEM Graduation Rates at UAlbany: A Holistic Model

Abstract

The Center for Achievement, Retention, and Student Success (CARS) is a comprehensive program that addresses retention of freshmen and transfer students in STEM fields at the University at Albany State University of New York (UAlbany). We utilize a holistic model reliant on the creation of learning communities through group study and support. We have met the original program goals: sustainability, institutionalization, provision of peer tutoring and peer/staff mentoring, ongoing program evaluation, and dissemination.

The program continues to grow as evidenced by an increase in the number of tutoring sessions by 1,102% from year one to year two. As a result, pass rates in key gateway courses have improved. For example, the pass rate in Organic Chemistry I increased by 9% in year one and by 18% in year two, while the year one pass rate in General Chemistry I increased by 7%.

Based on these two courses alone, 98 additional students will proceed toward graduation in STEM as a result of CARS services. Inclusion of the data for Genetics, Physics and General Biology II increases this number by a factor of two. We specifically tracked STEM major sub-groups of female, self-identified minority and transfer students.

CARS tutoring had a statistically significant impact on pass rates of females in targeted biology, chemistry, and physics courses and on the pass rates of underrepresented ethnic groups for chemistry.

There was an increase in CARS participation among transfer students, from 8% to 13% from year one to year two, and the 10% increase in pass rates for minority students in organic chemistry in fall 2009 translates into 10 students who we anticipate would not graduate without CARS intervention. The project will be sustained because:

• It has a dedicated permanent fully furnished space from which to operate
• UAlbany has committed to continuing the CARS program coordinator staff line
• UAlbany has committed $150,000.00 annually in support of the CARS program at the termination of the grant funding period

GOALS AND STRATEGIES

Goals

• Increasing the 4-year graduation rates of a cohort of freshmen with declared STEM majors
• Increasing the 2-3 year graduation rates of transfer students entering into UAlbany in their junior year
• Institutionalizing the Center for Achievement, Retention and Student Success
• Increasing retention of historically underrepresented students in STEM majors
• Creating and supporting learning communities

Implementation

• Establishment of CARSS Tutor Training Course (ACAS 498), a college wide course offered three consecutive semesters
• Acquisition of a permanent well-furnished space in a centralized location
• Appointment of a full-time program coordinator
• Appointment of qualified, trained tutors
• Provision of 3 types of tutoring services (weekly study sessions; review/recitation; one-on-one tutoring)
• Active evaluation since program’s inception including development of formative assessment instruments (survey tools, focus groups, daily student feedback, tutor round-table feedback sessions); realignment of goals to fit student population needs; identification of areas of greatest challenge to students; statistical analysis of incoming data; real-time program adjustments
• Program dissemination through electronic reserves, Blackboard, and a web site (www.albany.edu CARSS) brochures; faculty in-class support; participation in year around new student orientations; aggressive and continuous e-mail advertising of program offerings; prominently posted program flyers

Challenges & Opportunities

Challenges:

• Meeting the demand for those needing CARS services: The extreme cuts that have been made to SUNY funding have resulted in fewer academic support services for students. This in turn has meant that greater numbers of students in need are turning to CARS for assistance, and we cannot always meet the demand.

Opportunities:

• Tailored math tutor sessions: We have observed that students enrolled in STEM gateway courses such as general chemistry and genetics need additional assistance with the math that is germane to these subjects. To help these students, we are piloting a program in which tutoring services in math for general chemistry and genetics are offered alongside the courses when they are taught. Thus far, this has been well-received by students.

• Offer spring semester genetics and physics: We have observed that for certain courses, the demand for tutoring services varies depending upon the semester in which the course is offered. For example, the demand for genetics tutoring is significantly less in the spring semester compared with the fall. Therefore, we are considering devoting less of our resources towards the provision of genetics tutoring in the spring. The demand for physics tutoring is less than it is for all other courses combined. Thus, we are considering devoting the resources that are currently being directed to physics tutoring to other areas where there is greater demand, such as general and organic chemistry courses.