

Gordon State College STEM Grant Abstract

Gordon State College has historically served as an access, associate degree-awarding institution. In 2006, Gordon College became a state college and initiated its first 4-year baccalaureate degrees. Although the College currently awards nine baccalaureate degrees, preparation of students for transfer to sister institutions within the USG is still a major function. The demographics of our student population and rank distribution still reflect the College's heritage as an access, associate degree-awarding institution. The College enrolls slightly fewer than 4,000 students. The majority of students (~74%) commute to campus. The majority of students (64%) are traditional students. Women make up nearly 70% of the student body. Black or African American students comprise 40% of the student body, Caucasian students comprise 52% of the student body. The majority (64%) of students are enrolled full-time and 15% of students test into at least one area of learning support. Nearly a third of students declare nursing or a related healthcare career as a major. Only 24% of the student body declare a major related to a STEM CIP code.

The College awards two baccalaureate degrees in STEM fields, a Bachelor of Science in Biology and a Bachelor of Science in Mathematics. In the last three years, the College has graduated 74 students with a baccalaureate degree in biology and 10 students with a baccalaureate degree in mathematics. As newly initiated four-year programs at a historically two-year college these numbers are consistent with the College's enrollment. However, high DWF rates in STEM gateway courses impede student progression in the curriculum and persistence to graduation.

This grant is taking several approaches to better understand and address the retention and persistence of students. To assist students in gateway courses the College will use grant funding and matching institutional funds to develop and staff a STEM Learning Center for students. The Center will include ancillaries and learning materials recommended by the faculty. Student employees/tutors will be staff the Center approximately 35 hours per week. SI leaders will be hired for several high DWF gateway courses. SI leaders will hold their tutoring sessions in the STEM Learning Center. Additionally, STEM faculty will be encouraged to spend at least two of their office hours per week in the Center. The Center will serve as a gathering spot for STEM majors. This should help build community, encourage peer tutoring and improve student retention.

A student's foundational knowledge, particularly in mathematics is essential for success and retention in STEM fields. Faculty involved in the project will develop concept inventories related to the Georgia Science Standards. The Georgia Performance Standards describe topics in which students should have competency before they graduate high school. Concept inventories have been developed in many sub-fields of STEM to identify the knowledge base of students. There is no such inventory for higher education use for student knowledge in the context of the Georgia Performance Standards. The faculty-developed-STEM Concept Inventory will be used to identify potential gaps between the stated outcomes of the Georgia Performance Standards and the knowledge students demonstrate. College curriculum is predicated on a basic STEM knowledge base. If that base does not exist than curricular changes are needed to bridge the gap between expected and actual knowledge. This information will be used in working with partner high schools to develop high school faculty enrichment programs.

Another facet of the project involves data mining and predictive analytics techniques to explore student

demographic and academic history data to identify any correlative factors related to student success in STEM fields. Once correlative factors are identified, it should be possible to develop proactive advising strategies that facilitate retention of at-risk STEM students. Advising could begin as soon as students have completed all of their admissions paperwork. It may be possible to extend data mining and analytic modeling techniques to identify high schools from which successful and less successful STEM students graduate. This information could then be used to focus recruitment efforts and to identify schools which may benefit from partnership opportunities. Ultimately, this should lead to a stronger regional STEM pipeline and future P-16-directed grant submissions.

The final grant activities involve the development of student surveys. Currently the College has very few venues through which we gather student feedback and none of them specifically seek feedback on STEM-related concerns. Student attrition from STEM majors (change of major) is high. A survey will be developed by faculty committee members in consultation with Program Managers to address student satisfaction with the programs and potential reasons for students to change majors. This survey will be administered to students who change from a STEM to a non-STEM major. A second survey will be developed similarly to the survey above and administered to existing STEM majors. This survey will address many aspects of the program and college procedures that may impact student satisfaction with the program. A STEM attitude survey will be developed and administered to entering freshman. The surveys will identify those students with positive attitudes toward STEM. These students could potentially be recruited to STEM majors.

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