Creating an Effective Retention Program

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Dr. Gaskins is the Assistant Dean of Inclusive Excellence and Community Engagement in the University of Cincinnati College of Engineering and Applied Science, the only African-American female currently teaching in the faculty of the College of Engineering. Whitney earned her Bachelor of Science in Biomedical Engineering, her Masters of Business Administration in Quantitative Analysis and her Doctorate of Philosophy in Biomedical Engineering/Engineering Education. In her role as Assistant Dean, Dr. Gaskins has revamped the summer bridge program to increase student support and retention as well as developed and strengthened partnerships in with local area school districts to aid in the high school to college pathway. In 2009, she founded The Gaskins Foundation, a non-profit organization, whose mission is to educate and empower the African American community. Her foundation recently launched the Cincinnati STEMulates year round K-12 program, which is a free of charge program that will introduce more students to Math and Science. She was named the 2017 K12 Champion by the National Association of Multicultural Engineering Program Advocates (NAMEPA).

Dewey Burnell Clark Jr

Full Paper: Creating an Effective Retention Program

Abstract:

The Choose Ohio First Scholarship program is designed to significantly strengthen Ohio's competitiveness within Science, Technology, Engineering, Mathematics and Medicine (STEMM) disciplines and STEMM education.

The Choose Ohio First Program is the University of Cincinnati College of Engineering and Applied Science's retention program for first year students. There are 33 freshman engineering students currently enrolled in the cohort of STEMM students. Through the program the students receive competitive scholarship funding and professional development workshops which help prepare them to enter into the STEMM workforce.

Prior to their freshman year, students participate in a summer bridge program. The students spend seven weeks in a real-life college environment. They live in a residence hall and are enrolled in courses such as Pre-Calculus/Calculus, Physics, Chemistry, English and Engineering Models. Upon arrival on campus for the residential program, the students take assessment examinations to determine the courses in which they will be placed in the Fall and/or Spring semesters.

At the beginning of each semester of their first year, students are enrolled in Collaborative courses for Calculus. These classes meet for one-two hours per week. The students are also required to attend monthly workshops and/or socials which are facilitated by corporate partners who provide the students with guidance on being successful in their courses and their co-op experiences.

As part of the retention program, students are required to perform fifteen (15) hours of community service each semester, complete and essay related to their experience, complete reflections after the monthly socials to share their learned experiences, meet once per semester with their Choose Ohio First Program coaches and track their progress using our e-portfolio system. We monitor the students' experiences through surveys and self-reflections and well as through progress reports from their professors. Our results are then compared to other students in the College of Engineering.

Successes and opportunities for improvement, program compliance data and next steps will be shared in the conference paper.

Introduction:

To ensure a diverse and well-educated workforce, we must increase the number of women and ethnic minorities enrolling and graduating from programs in engineering. The College of Engineering and Applied Science (CEAS) at UC has 4,214 undergraduate students, with 16.9% women, and 1,217 graduate students, with 24.6% women, who are taught by 170 full-time faculty members. Virtually all, 89.1%, of UC's CEAS undergraduate students reside in Ohio. In

Ohio, the total K-12 population is 1,692,347. Gender makeup is ~ 50-50 (male-female); major ethnic groups are white and African-American, with an average of 73% white, 25% ethnic minorities, and 48.5% from low-income families [1]. However, our efforts to recruit from this pool of ethnic minority students is < 3% in the CEAS programs in a college with a 40% attrition rate. An aggressive retention strategy was created for underrepresented minority students.

In order to increase the number of students who persist to complete a bachelors degree, the retention plan includes strategies for making sure that a diverse group of selected students have a high probability of being successful throughout their academic careers, are properly motivated for that entire span, maintain a sense of comradery and graduate from an engineering program of their choice. The Choose Ohio First Program is a collaborative program between CEAS, Arts and Science and Allied Health. The strategies are presented in the order that students will see them applied.

Program Components:

Summer Bridge Program: The 7-week Summer Scholars Bridge Program (SSBP) [2-3] is a residential program prior to freshman enrollment. The SSBP objectives are to: 1) develop the academic and social skills necessary for achieving academic success; 2) acclimate students to the campus environment prior to their arrival as full-time students; 3) pair the students' math ability with the appropriate Fall semester Calculus course; and 4) develop a cadre of students mutually committed to each other's success. SSBP students enroll in 7-week versions of Calculus, Chemistry, Physics and English courses. All instructors use collaborative learning, in which students work in heterogeneous (in terms of ability level) teams, both in class and during organized study sessions. Students who pass the Summer Bridge English course receive advanced standing for English 1001. The SSBP ends with a Graduation Luncheon Ceremony for the Bridge students and their parents/guardians/siblings. Bridge instructors and college and university administrators are invited. Meritorious Bridge student scholastic performances are recognized in various categories

E-Portfolio: The students will be coached in using an E-Portfolio system to document their experiences. Each student will prepare and upload a reflective essay documenting their professional career aspirations and its relationship to the college education.

Collaborative Courses: These are intended to support learning in Calculus and Physics, the historic 'weed-out' courses for engineers, and are attended by all selected Bridge students. The SCLC courses meet twice a week for 2 hours in addition to the regular Calculus or Physics course which is part of the curriculum. Students work in 4-6 member heterogeneous groups providing a comfortable environment to ask questions and learn. SCLC further strengthens the learning community built in the SSBP.

Monthly Socials: To strengthen the learning community, 3 to 4 monthly socials throughout each semester will allow students to interact with invited professionals and upperclassmen in an informal setting. Each monthly social will revolve around a theme and speaker(s), for example, reducing stress during midterms and finals, time management, setting high expectations, undergraduate research, international experiences, community engagement, *etc.*

Progress Reports: Progress reports help students monitor their academic performance throughout the semester. Each student is required to fill out 2 progress reports per semester for each course. A secondary goal of each progress report is for improved faculty-student interaction.

Community Engagement: Each student is required to perform 15 hours of volunteer K-12 approved outreach service and document the experience. For an experience to be approved students must complete their hours with a program that has a focus on STEMM. Documentation is submitted in the E-portfolio.

Program Coaching: Students will arrange to meet the degree program academic advisor and an assigned project team member (program coaches) twice each semester (fall & spring). Prior to each meeting the student will submit instructor course progress reports for each course taken (2 reports/course/semester). At each meeting prescribed forms will be uploaded in the E-Portfolio.

Results:

All 33 engineering students participated in the Summer Scholars Bridge Program. At the conclusion of the summer bridge program students were placed in either Pre-Calculus or Calculus based on performance and were all enrolled in the corresponding collaborative courses. During the Fall semester students built their profiles and uploaded all necessary documentation to the E-portfolio system. Data presented in this section is from the Fall Semester of 2018.

Monthly Socials

Table 1: Fall Semester 2018 Monthly Social Attendance

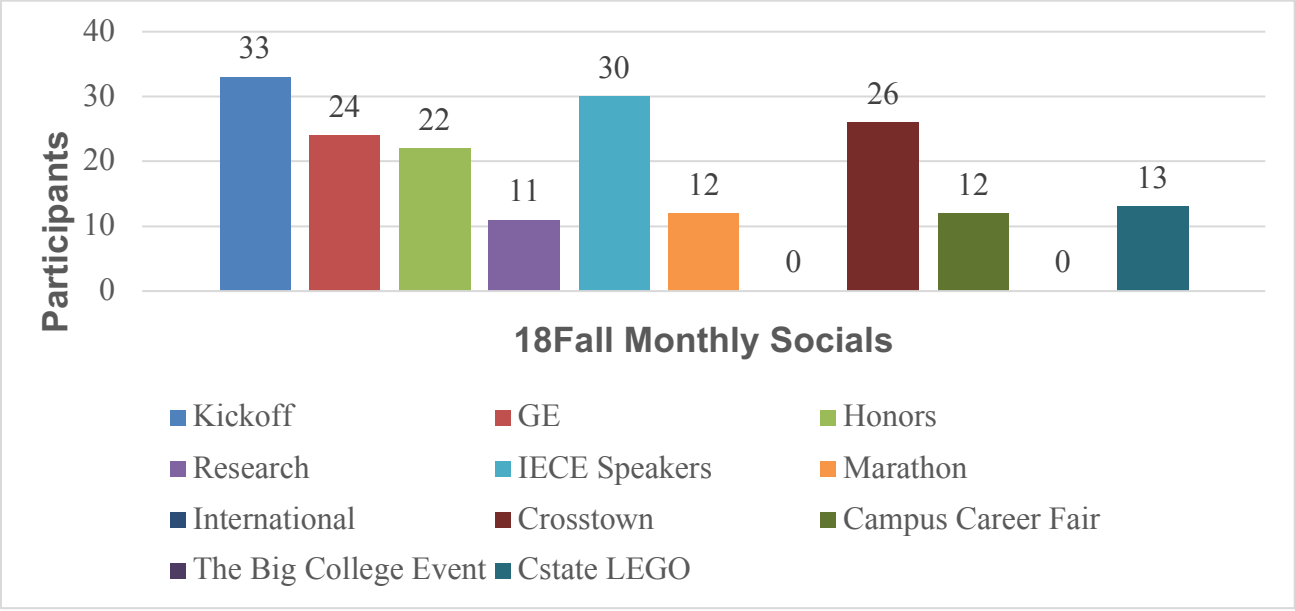

Table 1 illustrates scholar participation in the various scheduled monthly social activities. Scholars had the option to choose the monthly social activity of interest in months where multiple options occurred. Attendance at only social activity per month was required for

compliance. The scheduled social activities are targeted events offering content and discussion that is topical, skill-building, thought provoking.

Table 2: Number of Monthly Social Reflections Submitted

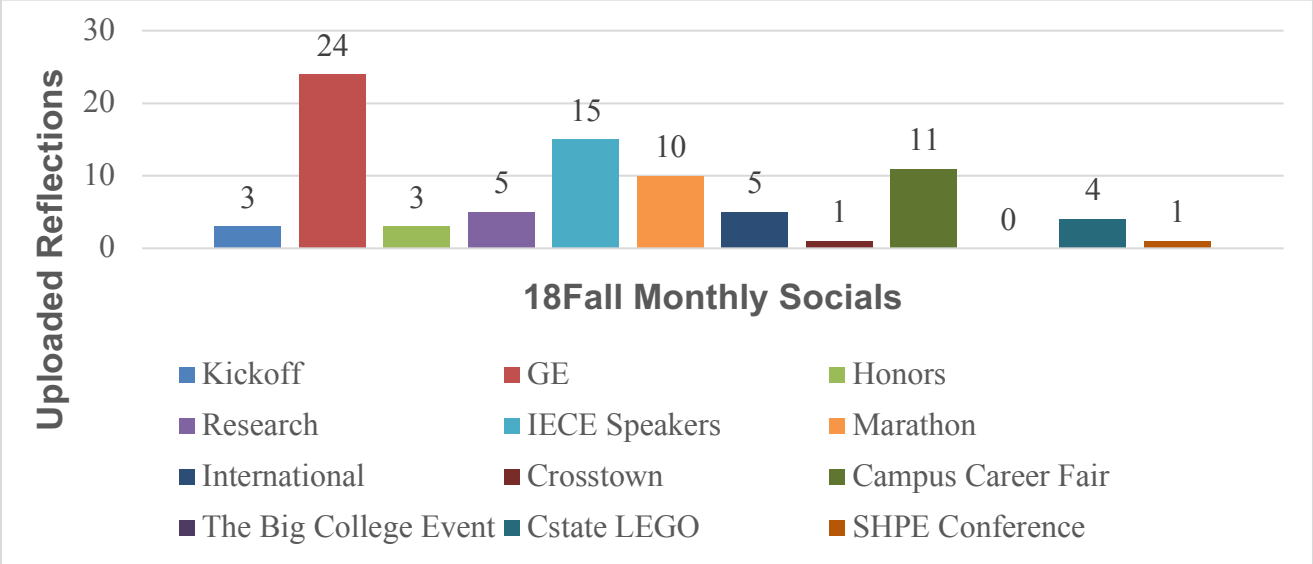

Table 2 illustrates scholar eReporting through reflective writing exercises as monthly social activity follow-up. Scholars had the option to choose the monthly social activity of interest in months where multiple options occurred. Attendance at only social activity per month was required for compliance. This means that attendance at a monthly social didn't necessarily correlate to the scholar completing a social reflection about that topic.

Progress Reports

Table 3: Progress Report Compliance for Fall Semester 2018

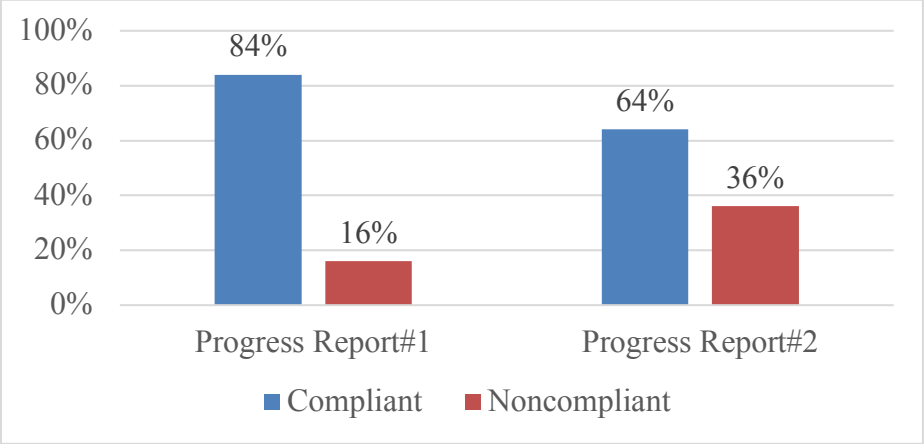

Table 3 highlights the percentage of students that completed the required progress reports. Scholars were required to complete 2 academic progress reports (PRs) during the semester (September month-end & October month-end). The timing of the PRs was strategically

positioned to allow of early identification of support needs. The eReported data shows that more scholars completed academic progress reporting earlier in the semester.

Community Engagement

Table 4: Number and Frequency of STEMM Community Engagement Hours Completed

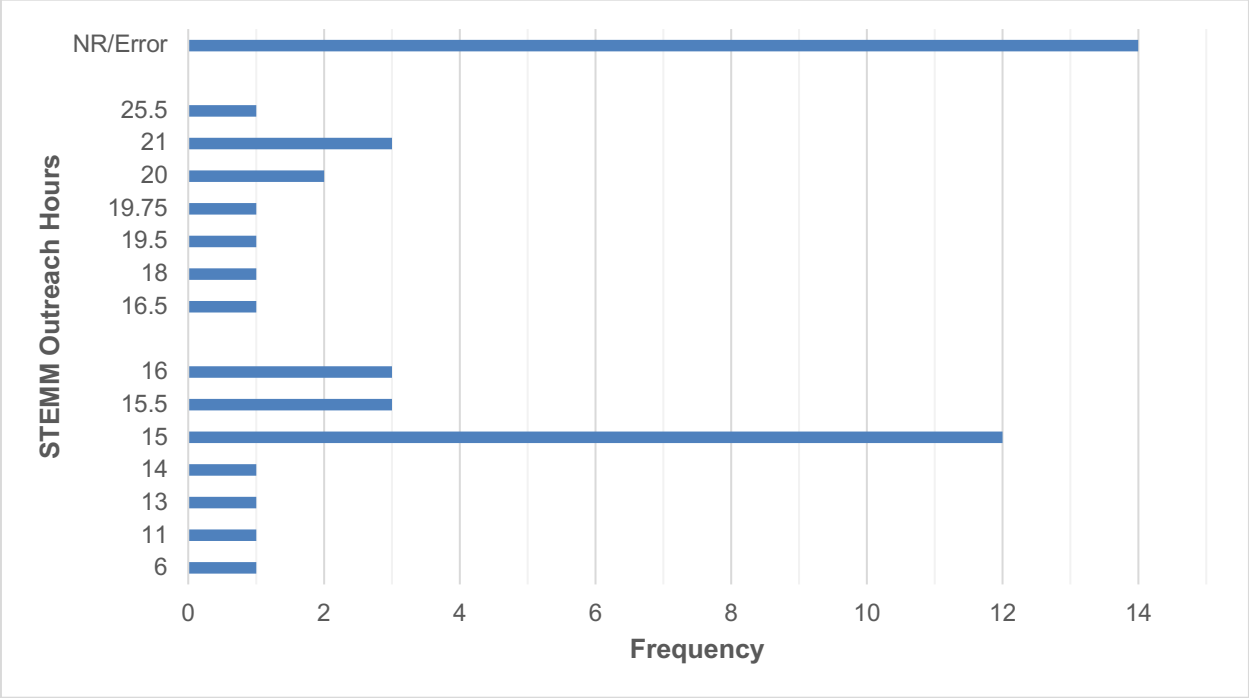

Table 4 illustrates the eReported frequency for which scholars executed STEMM engagement service. Scholars where expected to complete a minimum of 15-service hours per semester for compliance. Data reveals that most students reported completing exactly 15-hours. The data also shows that several student exceeded the 15-hour target. Additionally, the evidence indicates that not all scholars successfully completed the eReporting process.

Program Coaching

Table 5: Program Reporting Compliance for Fall Semester 2018

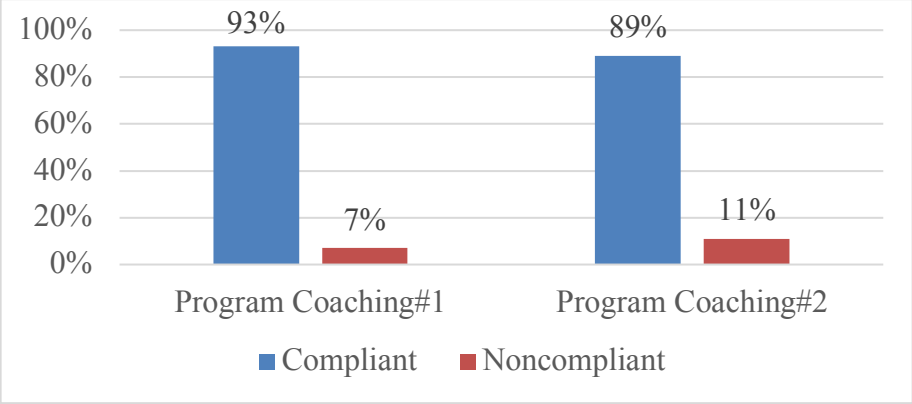

Table 5 highlights the percentage of students that completed the required program reporting. Scholars were required to proactively schedule 2 program coaching sessions (PRs) during the semester. The eReported data shows that nearly 90% of scholars completed the program coaching.

Overall G.P.A

The overall cohort g.p.a was a 3.22 with 26 out of 33 students averaging above a 3.00. Of the students below a 3.0 g.p.a five were above a 2.5 g.p.a.

Overall Retention

Of the 33 engineering students who began in our program, 29 remained in the College of Engineering and Applied Science going into the Spring Semester. This represents a retention rate of 88% in comparison to an 86% retention rate for the remainder of College. Of the four students who left the college, 1 left for health reasons and 1 transferred into another STEM major to ensure all pre-med requisites would be completed.

Discussion:

From our initial compliance check this program has shown promise in helping students excel academically as well as retain students to CEAS. We have also found that interaction with companies have helped prepare students for networking and securing internships/co-ops. We can also see that all program requirements are not easy for students to complete i.e. STEM engagement hours and progress reporting. Students have informally mentioned difficulty with time management and priority setting. They have also discussed in monthly socials and coaching meetings discomfort in approaching faculty for progress reports.

Next Steps:

Analysis of Spring Semester data and overall comparisons to a peer cohort will be imperative to understand effectiveness of the overall program. Qualitative data will be collected via focus groups at the end of the Spring semester to better understand what students identify as the most effective program components. There is also a continued need to understand what barriers, if any, our program may be causing students.

References:

1. Ohio School Report Cards. (2019). Data retrieved on February 25, 2019 from https://reportcard.education.ohio.gov/
2. Tinto, V. (1998). "Colleges as Communities: Taking Research on Student Persistence Seriously," The Review of Higher Education, Vol. 21, Issue 2, Winter, pp. 167-177.
3. Gandara, P. (1999). The Dimensions of Time and the Challenge of School Reform (Suny Series, Restructuring and School Change), ISBN: 0791443582, State University of New York Press, December 1999.