WIP: Surprises in Student Stress and Academic Support SURVEY

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WIP: Surprises Found in Student Stress and Academic Support Survey Rawle D. Sookwah¹, Bob Petrulis², and Edward P. Gatzke^{1*}

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Abstract - Nearly 300 students in the University of South Carolina Molinaroli College of Engineering and Computing participated in a survey investigating a variety of topics related to academic progression. Some surprising trends were seen related to stress and use of academic supports. In summary, students reported significant stress related to academic success while indicating limited stress related to homesickness or family issues. Students reported frequently attending lectures but ranked lectures least effective among academic supports. Reading course material, seeking help from TAs, and visiting faculty office hours were all rated as very useful activities. However, these supports were reported as infrequently used by survey respondents. Findings from this work will be used to improve first-year students retention efforts such as University 101 courses, the college Living and Learning Community, and a First-Generation Student (FGS) summer start program.

Introduction - Mentorship and scholarship networking provided by STEM Intervention Programs (SIPs) facilitate the academic and social integration of First-Generation Student (FGS) populations [1-3]. FGS challenges include lower family guidance, financial stressors, unfamiliarity with student support services, and lower belonging [2, 3]. SIP programming addresses these deficits through the provision of resources and programmatic integrations opportunities that can improve FGS resilience and mediate the impact of stressors [4]. Researchers have explored the impact of SIP on student emotional intelligence, program satisfaction, and self-efficacy noting their impact on FGS retention [1-3]. This research seeks to expand the growing literature on SIP implementation through assessing FGS perceived stressors, use of academic supports, and perceived utility of the support systems.

The Molinaroli College of Engineering and Computing at the University of South Carolina serves approximately 3,000 undergraduate students, representing close to 11% of the overall student body at the university. In academic year 2021-22, only 22.5% of the undergraduate students in the college were female. Black students comprised 10% of the undergraduate population, with 7% self-reporting as Asian, 6% Hispanic, and 4% reporting as two or more races. Only 22% of students in the college identify as a FGS. Various college-level efforts have been made to improve first-year student retention, including college-specific UNIV 101 sections, a Living and Learning Community for students in the college, and a summer start program targeting the college FGS population. Educational efforts for first-year students can be improved based on better understanding of student stressors and the effectiveness of academic supports.

A research team supported by an NSF S-STEM award recruited multiple cohorts of students with high financial need. The "Synthesized Program for Undergraduate Retention" (SPUR) team made efforts to encourage FGS applications. The SPUR students were supported with access to special classes, mentorship programs, career center coaching, and wellness education. Students in the program were periodically interviewed by members of the research team. The students were also asked to complete surveys related to self-efficacy, stress, and academic supports. The survey was also offered to all undergraduates in the college.

Survey Methodology – An online survey was developed to compare factors which may influence undergraduate student persistence in engineering and computing. The original motivation for the survey related only to self-efficacy / identity and differences between FGS and non-FGS students. Survey questions were adapted from previously developed instruments on self-efficacy, sense-of-belonging, identity, community involvement, and overall college experience [5-7]. Additional questions were added related to stress levels, academic life, use and effectiveness of academic supports, and the impacts of COVID-19 on their college experiences. Participants ranked stressors from 1 (most stressful) to 8 (least stressful). Participants were also prompted with 15 support resources rating their frequency of use on a 6-point scale ranging from 1 (never) to 6 (every/almost every day) and perceived effectiveness on a 5-point scale ranging from 1 (very ineffective) to 5 (very effective).

All engineering and computing students were invited to participate in the survey with 278 (10.4% of college total) providing responses. Respondents included 11 FGS student participants from the S-STEM SIP, of which 5 were first-year students (SPUR Cohort 1) and 6 were second-year students (SPUR Cohort 2). The remaining 267 respondents were undergraduates ranging from first-year to fourth-year or greater in the college. The team compared responses by level of academic progression, declared major, gender, and race/ethnicity.



🛛 Cohort 1 (5 responses) 📮 Cohort 2 (6 responses) 🔳 Non-SPUR Engineering Frosh/Soph (116 responses) 🔲 Non-SPUR Engineering JR/SR (151 responses)



Survey Results – Some of the more interesting findings in this survey emerged from the questions related to stressors and academic supports. Figure 1 shows a summary of average responses related to stressors with group averages for SPUR Cohort 1, SPUR Cohort 2, students in year 1/2, and students in years 3/4. The table is sorted by overall average reported stress for all groups combined. Note that generally, all four groups reported similar stress levels. Cohorts 1 and 2 in some cases show differences but this is probably related to the low size of the population relative to the overall college group. Table 1 shows a list of academic supports with overall average values for frequency of use and perceived value. Surprising findings related to support utilization, perceived effectiveness, and stress include:

1. Students were generally not worried about living away from home or family issues relative to other stressors.

- 2. Students were most concerned about grades and finances overall.
- 3. Older students in the college are more concerned about finances than younger students.
- 4. Students most often attended lectures and prepared for class but felt these were least effective of the academic activities.

5. Students rarely sought help from TAs or tutoring but felt these supports could be of moderate value. 6.

Students do not feel office hours, lectures, or supplemental instruction sessions are particularly effective. 7. Students rarely did extra readings but ranked it most effective overall.

Some differences are seen between SPUR cohorts 1 and 2 and the much larger non-SPUR groups. One may assume the non-SPUR students to be representative of the college FGS population at around 22% while 100% of the SPUR students identify as FGS. Cohort 1 had more stress related to academics, exercise, family, and COVID restrictions. Cohort 2 showed higher stress related to roommates / friends and living away from home. Again, both SPUR cohort groups in the survey are quite small (N=5, N=6) so one may not say these trends are conclusive.

Impact on Future First-Year Students – A summary of these findings will be shared with various stakeholders in the college working with first-year students to help the educators better understand the student

population and the needs of the students. Additional efforts can be made related to educating students in areas of academic success and financial literacy to potentially help reduce stress. Improved time management could allow for additional use of rarely used academic supports. Informing new students what more senior students see most value in could help the newer students make more informed choices for academic preparation. This will be accomplished by working with two different groups of first-year students: Engineering and Computing University 101 course sections and the Engineering and Computing Living and Learning Community.

| | | Assessment of | Wish to do it |
|------------------|-----------------------------------|---------------|---------------|
| Frequency of Use | Support | Effectiveness | more |
| (Rank) | z | (Rank) | (Rank) |
| 1 | Attended in-person lectures | 15 | 15 |
| 2 | Came to class prepared | 13 | 13 |
| 3 | Studied for exams | 2 | 2 |
| 4 | Worked assigned homework problems | 4 | 4 |
| 5 | Reviewed notes | 6 | 6 |
| 6 | Worked extra homework problems | 3 | 3 |
| 7 | Study group | 7 | 7 |
| 8 | Re-watched lectures | 5 | 5 |
| 9 | Online lectures | 14 | 14 |
| 10 | Did optional/extra readings | 1 | 1 |
| 11 | Supplemental instruction | 11 | 11 |
| 12 | Went to office hours | 12 | 12 |
| 13 | Got help from TA | 10 | 10 |
| 14 | Tutoring | 9 | 9 |
| 15 | Student Success Academic Coaching | 8 | 8 |

Table 1. Academic supports with survey results for frequency of use and perceived effectiveness.

The college and university are making special efforts to support FGS students, especially during the first-year transition. In 2022, a cohort of nearly 30 engineering and computing FGSs were invited to campus for a period of three weeks before their first-year matriculation. During this time, the students completed a single non-technical core class. Activities were included for team building. Additionally, time was spent reviewing math concepts to aid in preparation for their upcoming academic year. In the summer of 2024, the format of the summer start changed to a four-day early move-in focused on community building and math remediation. The current survey findings have shaped the summer start program resource implementation. New in 2024, the university is opening a new FGS center and living and learning community on campus. Findings will also be shared with this broader community.

Conclusion – Students reporting grades and finances as their largest stressors was consistent with a breadth of engineering literature on FGS entry and persistence [1-3]. Distance from and issues within the family system are commonly reported stressors for FGS, our findings contrast with this literature and necessitate exploration of factors that mitigated this stressor. The discrepancy between the utilization rate of student success academic coaching, tutoring, TAs, and office hours relative to the perceived usefulness prompts further research into the variables that contribute to lower help-seeking exhibited by FGS. Furthermore, the discrepancy between highly valued extra readings and low engagement with these resources should be examined to determine why extra reading is rarely used for class. Exploring the relationship between study habits, efficacy development, and exam outcomes can clarify the strategies that enable content mastery and encourage continuation of these behaviors. Assessing students perceived effectiveness of distinct lecture characteristics can inform course development and intervention programs. In the future, additional investigation could seek to understand exactly why lectures and office hours are not seen as a valuable academic support. Continued scholarship on the unique experiences of FGS is integral to promoting continued entry and persistence through engineering education. Expanding on this research through assessing the relationship between perceived support effectiveness, frequency of use, and content mastery outcomes can edify SIP development and deepen understanding of FGS experiences within engineering education.

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