Weekly Professional Development Lunches to Build Community Among an S-STEM Cohort

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Abstract

This student-led research will assess a weekly lunch that eight faculty mentors implemented at Louisiana Tech University to promote student retention for an S-STEM scholarship cohort of approximately twenty engineering students. The faculty mentors hosted the students by providing simple home-cooked meals, which helped reduce food insecurity among the cohort while providing a venue for professional development. These lunches also provided an informal way for the faculty to connect with the students while fostering peer-to-peer relationships. The weekly lunch was initiated in the winter quarter of the first year of study for the participating students. As students moved into their sophomore year and began to enroll in separate, major-specific courses, the lunches helped to preserve previously formed relationships and group identity.

While the weekly lunches focused on social interaction and provided a relaxed environment for catching up, each lunch included professional development "nuggets" strategically timed to increase impact. Example activities included the initial introduction of faculty mentors, talks from Ph.D. students, ambassadors from student organizations, discussions about academic success, interview skills in preparation for upcoming university career fairs, and research opportunities for undergraduates.

This paper quantifies the impact of the lunches on professional development, group identity and belonging, connections with faculty mentors, and academic success using a 25-question survey. The survey includes Likert scale questions, yes/no/unsure questions, and open-ended discussion questions. While survey results show that students enjoy the lunches and believe the social and professional support activities are beneficial, the results are mixed on whether or not the lunches play a role in their decision to remain in an engineering major.

Introduction

S-STEM, or Scholarships in Science, Technology, Engineering, and Mathematics, is a National Science Foundation program that seeks to increase the success of low-income, academically talented students. A university scholarship of up to $10,000 annually is awarded to selected students. In addition to the scholarship funds, S-STEM programs offer additional activities and resources [1]-[4]. For example, Southern Methodist University provided their S-STEM students with weekly seminars and block scheduling which positively impacted the students and their ability to excel academically. While various academic and support resources are included in the

implementation of the S-STEM Program discussed here, this paper's focus is the impact of weekly lunches on our students.

Student retention is typically influenced by feelings of self-efficacy and inclusion in engineering spaces [5]-[6]. Reasons for attrition include classroom and academic climate, grades and conceptual understanding, self-efficacy and self-confidence, interest and career goals, and sexism [7]-[8]. Geisinger and Raman [7] argue that two main reasons for student attrition are inadequate teaching and the competitive, anti-collaborative nature of the engineering program. Self-efficacy and supportive mentors and teachers are significant factors in student retention, perhaps even more valuable than student's grades [5], [7]-[9]. If students feel they can succeed in their chosen field and have a strong support system, they are less likely to drop or switch majors, even if their GPA is not as high as their peers.

Students with a higher sense of belonging in their academic studies typically have a higher retention rate in their programs [7]. Sense of belonging can be increased by connecting students from similar backgrounds so they don't feel isolated in their chosen major. A study conducted at Oregon State University [10] shows that engineering students feel more comfortable in groups of people who share a similar background. Students in the majority of the American population (ex., White, male, straight, able-bodied) experience a higher sense of belonging in typical classroom settings than those in the minority. The LATTICE [11] and M-STEM [12] Programs corroborate this finding, suggesting that students who establish connections with similar groups experience an enhanced sense of belonging and are consequently more likely to be retained at increased rates.

"Communal eating, whether in feasts or everyday meals with family or friends, is a human universal, yet it has attracted surprisingly little evolutionary attention [13]." Although there is limited research concerning the relationship between engineering students fostering connections over food, several studies show an increased sense of belonging in people when bonding over food [14]-[17]. There is a significant increase in attendance rates at meetings or informational sessions where food, especially free food, is offered. Research carried out at the Mayo Clinic revealed that the presence of food significantly increases the likelihood of individuals attending an event [17]. Therefore, free food offered at meetings, including inexpensive options like pizza or tater tots, can be an effective strategy for increasing attendance at professional development gatherings.

Research has demonstrated a positive link between professional development initiatives at universities and the retention rates of students [18]-[19]. Many universities have implemented professional development courses in their engineering curricula [20]-[21] with positive results. Professional development provides students with academic and real-world knowledge and skills that they may not have been exposed to otherwise, especially if they are from a household

without access to these resources. “Lunch and Learns” provide a workplace setting where employees can learn about topics while being served food.

Many of the above elements are directly integrated into our specific S-STEM implementation as discussed in the following section.

Overview of the S-STEM Program and Weekly Lunches

The SUCCESS Scholars program began in the fall term of 2022 at Louisiana Tech University and was funded by a $1.5M S-STEM grant from the National Science Foundation (NSF). The purpose of the Program was to increase the success and retention of financially disadvantaged students through academic, financial, and social support. Our implementation included the following elements:

1. Blocked engineering, mathematics, science, and communications courses, providing students with increased opportunities for interacting inside and outside the classroom;
2. Additional engineering course meetings to better prepare students for upcoming exams and project evaluations;
3. Supplemental instruction sessions with the assistance of upper-level Peer Mentors with specific emphasis on exam preparation and deep dives into difficult core course topics;
4. Faculty Mentors to assist with advising and discipline-specific guidance;
5. Professional Development Lunches, which are the focus of this paper, to provide a venue for professional development nuggets while building group belonging;
6. Social Activities, including bowling, holiday parties, movie nights, scavenger hunts, and game nights, to build bonds between participants;
7. Invited Guest Speakers to provide career advice and a glimpse into the professional world;
8. Career Assistance through resume preparation and introduction to the support staff at the Career Center to prepare cohort students for interacting with employers at the Career Fair; and
9. Industry tours to allow students to explore potential work environments they might enter after completing their studies.

The SUCCESS Scholars cohort originally consisted of 24 students chosen from a pool of applicants that met the requirements of the S-STEM Program (low-income, academically talented). The goal was to combine best practices of other S-STEM programs together to provide tiered support for the students using the nine elements mentioned above. The initial focus of the effort centered around direct academic support (elements 1, 2, and 3 above). However, as students progressed further into their studies, the program’s focus shifted toward professional development opportunities, including career/internship preparation such as interview skills, writing a resume, and applying for jobs.

Mentors. The cohort was assigned two peer mentors at the beginning of our S-STEM Program. The students were also assigned a faculty mentor toward the end of their first year based on their chosen discipline. “Peer mentors have a greater impact in the early years of an S-STEM student’s academic career, while faculty mentors become more influential in later years [22].” Faculty mentors have proven to be successful in helping students achieve their academic goals [23]. The goal was that the students would interact regularly with their peer mentors during the first year and then be supported more heavily by their faculty mentor during the remainder of their academic experience. Our faculty mentors engage with students during the weekly lunches and provide educational support through assistance with scheduling and navigating available resources.

Lunches. The lunches were a weekly event in the engineering building, a central location where most students had classes. Each week, the faculty mentors planned a lunch served at no cost to the students. Once the students arrived and made their plates, they would socialize with their classmates and faculty mentors, sitting at tables with six chairs. A professional development nugget would be delivered after 20-25 minutes of eating and socializing. The professional development nugget would be a 10-15 minute long discussion from industry professionals, student organization ambassadors, graduate students, or professors. The professional development session focused on enhancing the student’s knowledge on a topic that would benefit them in their academic or future careers. After the professional development nugget, socializing would begin again until the lunch ended.

The lunch menu consisted of items that could economically feed about 30 people. Examples included red beans and rice, nachos, tacos, “totchos,” spaghetti, soup, chili, loaded potatoes, sandwiches, waffles, and hot dogs. Dessert items, either store-bought or homemade, were provided for each meal. Cheese dip and chips provided reliable comfort food almost every week. The faculty mentors typically prepared the food at their homes and brought it to campus on the day of the luncheon. Some items, such as grated cheese, ketchup, and other condiments, were kept in a refrigerator in the engineering building. A collection of slow cookers and air fryers allowed the food to be served hot.

Survey Results and Discussion

A 25-question survey was administered to participants to understand the impact the students experienced. Questions were drafted in the following categories:

- Three questions to document student academic profile and lunch involvement;
- Five questions related to professional development;
- Six questions to understand attitudes toward group identity & belonging;
- Three questions to gauge the extent to which relationships with faculty were strengthened;

- One question to determine if the lunches impacted academic success; and
- Seven open-ended questions to assess general satisfaction with the lunches and perceptions on how the lunches could be improved to increase impact.

This section presents the survey questions, the results, and an initial discussion of the results.

Academic Profile and Involvement in Lunches. Sixteen of 20 scholars responded to the survey. Eight respondents were majoring in mechanical engineering, two in electrical engineering, and two in cyber engineering. Additionally, one respondent each majored in construction engineering technology, civil engineering, biomedical engineering, and chemical engineering. All participants were in their second year of college. Eleven reported that they had attended all the weekly lunches, while the remaining five said they had participated in "most" of the sessions.

Professional Development. Tables 1 and 2 below provide student responses regarding the questions related to professional development. Examples of skills or knowledge gained from the professional development activities ranged from career building skills, study and time management tips, and professionalism.

Table 1. Student responses regarding professional development (1 = not at all; 5 = very strongly).

Question	1	2	3	4	5	Avg
How useful have you found the professional development activities (such as PhD students, ambassadors from organizations, discussions about academic success, etc)?	**0**	**0**	**3**	**5**	**8**	**4.31**
How relevant do you find the professional development activities to your engineering studies?	**0**	**0**	**3**	**6**	**7**	**4.25**

Table 2. Yes/No student responses regarding professional development.

Question	Unsure	No	Yes
Have the professional development activities helped in enhancing your understanding of the engineering field?	**0**	**0**	**16**

Tables 1 and 2 show that the SUCCESS Scholars have positive attitudes regarding the professional development activities delivered at the lunches. The overall results for the Likert scale questions are almost identical, and all 16 students found the professional development activities to be relevant to their engineering studies. A statement from one of the scholars further supports the relevance: "Professional development activities prepare us for everyday challenges or standards in the engineering field that we otherwise would not have learned as early on." The professional development activities also helped the students better understand the engineering

field, with one indicating that "having engineers elaborate on their daily jobs" helped them understand what to expect in the future. Another student commented that the activities helped them understand the "different paths that can be taken after getting a degree." These comments show that the Scholars appreciate and see value in the professional development activities presented during the lunches.

Group Identity and Belonging. One of the primary goals of the SUCCESS Scholars Program is to build a sense of belonging for the participants. Tables 3 and 4 provide student responses on the questions asked about group identity and belonging.

Table 3. Student responses regarding group identity and belonging (1 = not at all; 5 = very strongly).

Question	1	2	3	4	5	Avg
On a scale of 1-5, how strongly do you feel a sense of belonging within the group?	**0**	**0**	**1**	**5**	**10**	**4.56**
How important is the sense of group identity and belonging to your overall experience at the luncheons?	**0**	**0**	**1**	**8**	**7**	**4.38**

Table 4. Yes/No/Unsure student responses regarding group identity and belonging.

Question	Unsure	No	Yes
Have the luncheons helped you build meaningful relationships with other engineering students?	**0**	**0**	**16**
Do you feel more connected to your engineering program as a result of attending the luncheons?	**1**	**0**	**15**
Do the lunches play an important role in keeping the community built in your cohort alive?	**1**	**1**	**14**

These results indicate that the students feel a strong connection to the SUCCESS Scholars group and also believe the lunches play an important role in building and maintaining group identity and belonging. When asked to elaborate, one of the scholars stated, "I think everyone feels more safe and comfortable talking and asking questions or just relaxing when they feel a sense of belonging with their peers." Students reported that the lunches were beneficial by allowing them to "...work together to increase [their] chances of success," "...see the other students in a setting that isn't purely academic," and "...forget about classwork and mingle with their fellow peers." One of the students responded, "The lunches are a great way to catch up with peers in the SS group but other than that I would say I don't feel a difference," with another responding, "Seeing

the faculty frequently and being able to talk to them about more than just school or assignments has given me a better relationship with them than other students. I feel as though I'm a welcomed part of the engineering program." The student who answered "Unsure/other" when asked if the lunches allow them to feel more connected to their engineering program remarked, "I feel like I'd still have the same relationships with the same people, but I would see those people less so I am unsure of the result." However, most scholars reflected the sentiment of one scholar who stated, "Since all of us have split up into our major based classes, we rarely see all of each other now. The lunches allow all of us to reconnect, even if it is just one day a week."

Faculty Mentors. The mentors were mainly introduced to the Scholars through the weekly lunches. Each of the mentors introduced themselves to the group during one of the lunches. During the lunches, the students tended to sit with the other students, and the faculty tended to sit with other faculty; while not the purpose of this paper, the lunches also played a role in building the faculty mentor team. Most of the student/mentor interaction during the lunches were informal as opposed to scheduled.

Three survey questions were designed to understand the connection of the Scholars to the SUCCESS faculty as well as to their particular faculty mentor. The results from Table 5 shows that the students believe the lunches fostered better connections and interactions with their mentor. However, the feeling was not universal since four students were either unsure or said that they did not have meaningful interactions with their mentor during the lunches.

Table 5. Yes/No/Unsure student responses regarding faculty mentors.

Question	Unsure	No	Yes
Do you believe the lunches allow you to feel more connected to the engineering faculty as a whole?	**0**	**1**	**15**
Do you believe the lunches allow you to feel more connected to your faculty mentor?	**0**	**1**	**15**
Do you believe that you now have more meaningful interactions with your mentor as opposed to before the lunches?	**3**	**1**	**12**

The respondents stated that they "have gotten to know the professors personally through the lunches," and that "during the lunches we get introduced to many people in the department . . . it also gives us a casual environment to connect with them better." The students also said that the lunches allow them to feel more connected with their faculty mentor, stating that the lunches have allowed them "to have one on one conversations" and "provides an environment to connect with [their] mentors more casually." The student that answered "No" in Table 5 elaborated by saying, "I feel like the PD Monday's do a great job of giving us interaction time with our ENGR

faculty," referencing a separate time on Monday afternoons for the students to gather and collaborate. When asked if the lunches provided more meaningful interactions with mentors, the scholars had mixed responses. One of the students that answered "No" stated, "I don't feel a difference in the interactions, I feel like the connections I've made will last even if we stop having lunches." Conversely, a"Yes" respondent said "If I didn't see my mentor at the lunches, I would only see him when we advised and I wouldn't be as comfortable with him."

Academic Success. The survey contained a single question designed to measure student perception of the impact of the lunches on their decision to remain in engineering. Most respondents indicated a positive effect, while seven of the 16 were either unsure or said that the lunches provided no role in their choice of engineering as a major. Written responses to this question said the lunches were "a breath of fresh air" and "offer great support that is crucial in such a challenging major."

Table 6. Yes/No student responses on the lunches' impact on retention.

Question	Unsure	No	Yes
Do you think the luncheons play a role in your decision to stay in the engineering program?	**3**	**4**	**9**

Open-Ended Feedback. The survey ended with an overall satisfaction question and seven open-ended questions to solicit written feedback. The results in Table 7 show that students are very satisfied with the luncheons. When asked about their favorite part of the lunches, students said things such as, "Being able to hang out and have a good time with friends. When we were there I felt less stressed and more relaxed. Like the weight on my shoulders was off just for a bit."

Table 7. Student responses on overall satisfaction (1 = not at all; 5 = very strongly).

Question	1	2	3	4	5	Avg
Overall, how satisfied are you with the weekly luncheons?	**0**	**0**	**0**	**2**	**14**	**4.76**

When presented with the question of what could be improved about the lunches, the majority of the students responded with "nothing." A few students suggested that there be an effort to mix up the seating arrangement from time to time. The students had varied responses to how the PD activities could be improved, suggesting new presentations on FAFSA and graduate school. When asked what would increase their sense of belonging, students suggested movie nights, board games, and team building activities. Most students said that they would recommend the lunches to other students. At the end of the survey, the students had the option to provide comments, and one student ended the survey by saying, "Even if I was having the busiest or

worst week ever, I always looked forward to the lunches as a time to get together with friends and relax for a bit. I really think having that helped me through a lot these past quarters."

Conclusions

Weekly luncheons were implemented as part of an S-STEM grant to provide a venue for professional development activities, help to foster group identity and belonging, strengthen connections with faculty and faculty mentors, and provide free food. The survey results show that the students overwhelmingly enjoy the lunches and believe that they provide significant social, academic, and professional value. The answers were analyzed to determine if the results varied based on the students' majors, but no significant correlation was found. The open-ended responses provided the faculty with ideas for increasing the impact of the luncheons. The faculty team intends to continue to include these luncheons as an important part of the S-STEM grant program.

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