Bridging the Barrier Between Underrepresented Tallahassee Students and STEM Enrichment Opportunities

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Background Information

- Title I schools are determined by the percentage of students at the school who are eligible for free or reduced-priced lunch. This correlates with low-income families.
- About 40 percent of students in the Leon County district come from low-income households.
- Most of the Title 1 schools of Tallahassee are located in the Southside area.
- Barriers students face at attending Science, Technology, and Mathematics (STEM) enrichment opportunities include financial stress, lack of transportation, or uninformed adult figures.
  - "Parents report a mean cost of $107 per week to attend programs offering STEM learning, compared to $74 per week for programs that do not offer STEM learning" (The Afterschool Alliance, 2020).
- STEM enrichment programs have been proven to provide students with skills in critical thinking, confidence, creativity, collaboration, and more.
- Research shows that students who are exposed to Science, Technology, and Mathematics (STEM) enrichment programs at a young age are more likely to enter the field in the future.
  - "Students who express interest in STEM in eighth grade are up to three times more likely to ultimately pursue STEM degrees later in life than students who do not express such an interest" (The President's Council of Advisors on Science and Technology, 2010, p. 19)
- Careers in the Science, Technology, and Mathematics (STEM) fields are currently lacking diversity in multiple types of demographics.
- Entrance into Science, Technology, and Mathematics (STEM) careers can provide those coming from underrepresented communities with stable, well-paying jobs.
- We are holding 2 fairs to provide the southside community of Tallahassee with resources for summer programs.
  - The Neighborhood STEM Camp Fair and Neighborhood Internship Fair target grades K-8 and grades 6-12 students, respectively.

Methods

1. Advertisement Expansion:

- Channels: We distributed flyers at a diverse range of venues, including churches, Title 1 schools, bus stops, grocery stores, neighborhood community centers, and health clinics. We would like to thank NHMFL PR department for their help with creating flyers, posting on social media etc.., as shown in Fig 5 and 6.
- We created and shared a promotional video on Facebook and Instagram to increase social media presence.

2. Direct Engagement with Schools and Communities:

- STEM Nights and Career Fair Visits: We attended school STEM nights and career fairs to directly engage with students, parents, and teachers.
- Teacher Engagement: We reached out to teachers at schools, requesting their assistance in presenting information about the camp fair to their students during class sessions.

3. Vendor Outreach and Camp Registration:

- Expanded Vendor Network: Due to our large action group, we were able to reach out to many more vendors.
- Camp Registrations: With increased efforts, we followed up with more camps and registered them or kept their information for the future.

4. Accessibility:

- Transportation to the Fair: This year, attendees had the option of signing up via Qualtrics ahead of time for free transportation to the fair if they need a ride as shown in Fig 1.
- Linktree Integration: We established a Linktree platform, as shown in Fig 2, containing comprehensive information about all the participating camps and internships. Individuals unable to attend the physical fair were able to access valuable information about the camps and internships.

5. Data Collection and Analysis:

- Registration Tracking: Qualtrics was utilized to track vendor and volunteer registration.
- Feedback Collection: Feedback forms (surveys) were given to participants to gather insights into the effectiveness of our outreach methods and to identify areas for improvement for future years.

Table 1: March 2, 2024 Internship Fair Attendees

	2022	2023	2024
Rickards	7	18	13
Godby	0	2	3
Other high schools	4	16	3
Total, high schools	11 (64% Title I)	36 (55% Title I)	19 (84% Title I)
Total, all ages	28 (29% Title I)	63 (54% Title I)	31 (63% Title I)

Transportation Survey

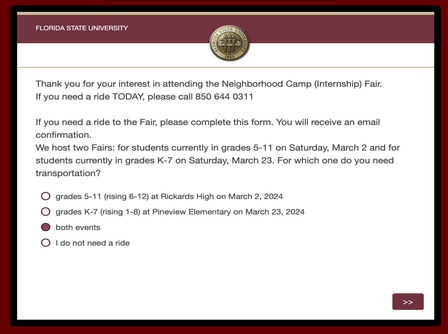


Fig 1: Transportation Survey offering free rides to the fair

Linktree

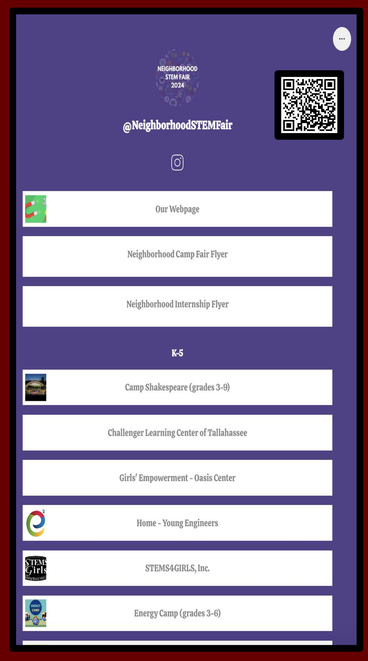
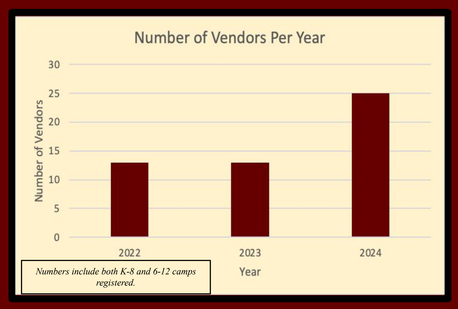


Fig 2: Linktree that provides links to our flyers, instagram, webpage, and camp websites has received 99 views and 216 clicks.



Numbers include both K-8 and 6-12 camps registered.

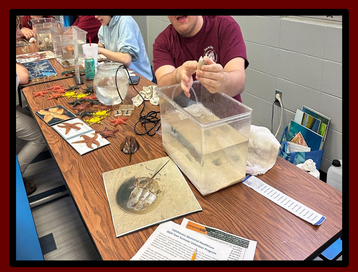


Fig 3: Saturday at Sea camp program @March 2nd event

Fig 4: SWAT leadership program @ March 2nd event

Fig 5: March 23 Neighborhood Camp Fair Flyer

Fig 6: March 2 Neighborhood Internship Fair Flyer

Results

1. **Promotional Presentations and Tabling:** We attended STEM Nights at Godby High, Fort Braden Elementary, a Bond Elementary Faculty Meeting, and Math Fun Day. During these events, we gave presentations about our fairs, showed promotional video and handed out flyers. A member of our team also gave a presentation to a science classroom at Fairview Middle. We reached out to 21st Century After School Programs regarding presentations and were not able to meet up in person.
2. **Identification of Free STEM Camps**:
   - We created a comprehensive list of over 50 STEM camps/internships in the Tallahassee area that can offer free spots to K–12 students. We had various STEM camp representing the diverse topics at March 2nd event, as seen in Fig 3 and 4.
3. **Accessibility:**
   - Transportation Survey: We had two people sign up for transportation. We are hoping to promote this opportunity better next year.
   - Bus Accessibility: To break the barrier of transportation to fairs, we collaborated with Star Metro administrator (Kathryn Frizzell) and evaluated bus routes to all STEM camps and provided it to the parents who attended the fair.
4. **Attendance:**
   - March 2 Internship Fair vendors: We had 24 vendors register for the March 2 Internship fair. At the fair we had 15 camps, the library, and StarMetro.
   - March 2 Internship Fair attendees:-We had a decrease in total attendees this year compared to previous years. However, we had an increase in the percent of attendees coming from Title I schools. Also, the reduction in total attendees from Middle school. We are hoping to see them at the March 23rd event catered towards K-8 students. Refer Table 1.

Conclusion / Future Work

1. **Encouraging Access to STEM Education**: Regardless of socioeconomic background or geographic location, our research highlights the significance of enabling K–12 students to have access to high-quality STEM education. Our goal is to increase educational equity and increase access to STEM learning opportunities by compiling an extensive list of free STEM camps. We are hoping to create an online database of STEM vendors in the Tallahassee area to ease communication in the future.

2. **Constant Improvement:** We acknowledge that STEM education is a dynamic field and that it is critical to keep our recommendations up to date and improved. Through feedback gathered from Qualtrics and other surveys, we will identify areas of improvement and work towards bringing more students to the fair.

3. **Collaborative Efforts**: In order to increase access to STEM education, our research emphasizes the importance of collaboration between students, educators, parents, and STEM organizations. Together, we can make the most of resources, exchange best practices, remove obstacles to participation, and encourage more K–12 students to pursue careers in STEM fields.

In conclusion, our findings are an advancement of equitable access to STEM education and the development of the upcoming generation of leaders, innovators, and problem solvers. We hope that by working together, K–12 students will be motivated and equipped to reach their greatest potential in STEM (Science, Technology, Engineering, and Math).

References

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