Central Florida STEM Alliance Paths to Engagement

Year 2 Annual Report
April 2023

Louis Stokes Alliances for Minority Participation Bridge to Baccalaureate:

Central Florida STEM Alliance Paths to Engagement

Year 2 Annual Report

HRD #2110071

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Executive Summary

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths) is supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to the Baccalaureate (B2B) funding from the National Science Foundation (NSF). The partner institutions that comprise the Central Florida STEM Alliance are Valencia College, Polk State College, the College of Central Florida, and Pasco-Hernando State College. Below is a summary of findings from the second annual report (January 2022- February 2023). The alliance commissioned Shaffer Evaluation Group to evaluate the project across the 3-year grant term funding period.

Student Focused Activities

- By the end of Fall 2022, the alliance successfully recruited 177 students across four institutions, an increase of 78 students from Year 1. Of the 177 recruited, 72% belonged to racial and/or ethnic underrepresented minority (URM) groups. A majority of students identified as Hispanic (*n*=78) or Black (*n*=51).

- To remain in the LSAMP program, students are required to complete LSAMP orientation in their first semester, meet with their advisor at least once per semester, and participate in at least three LSAMP activities or events per semester. While the percentage of students varied by term, the alliance was very successful with advising and orientation. Across the alliance 99% of students (*n*=129) completed orientation and 95% of students (*n*=53) met with their advisor at least one time in Fall 2022. Engaging students in at least three activities per term remains a challenge, with the percentage of students meeting this requirement each term varying from 32% to 35%.

- In Year 2 (Spring 2022 through Fall 2022), at least 193 different engagement opportunities were offered across the alliance, including workshops, conferences, STEM lab and industry tours, and field trips.

- Fifty-three LSAMP students across the alliance engaged in the 2022 STEM Summit, which was held in virtual format.

- Thirty-one students across the LSAMP alliance engaged in the 2022 Summer STEM Institute.

- Two alliance institutions engaged students in STEM professionalization in Year 2 (Spring 2022 through Fall 2022). In total, 16 students (potentially duplicated) participated in these important opportunities.

Faculty and Department/Institution Focused Activities

- Some progress was made with faculty-focused activities in Year 2 (Spring 2022 through Fall 2022). Faculty/staff were involved in student activities, with 428 (potentially duplicated) faculty/staff members participating across the alliance.

- The alliance reorganized CFSA work groups in Fall 2022. When the groups were first established, some faculty/staff were spread across several groups, which made it difficult for them to participate. The reorganization is anticipated to increase the effectiveness of these groups moving forward.

- Each alliance institution held regular implementation-team meetings with various staff members. Advisors across the partner institutions met monthly to collaborate. The Co-PIs, evaluator, and grant manager continue to engage in monthly conversations.

Sustainability and the Effect on the Colleges

- The presidents of all four participating colleges attended governing board meetings, which convened every six months. The high level of commitment and engagement demonstrated by institutional leaders bodes well for the long-term sustainability of LSAMP activities.

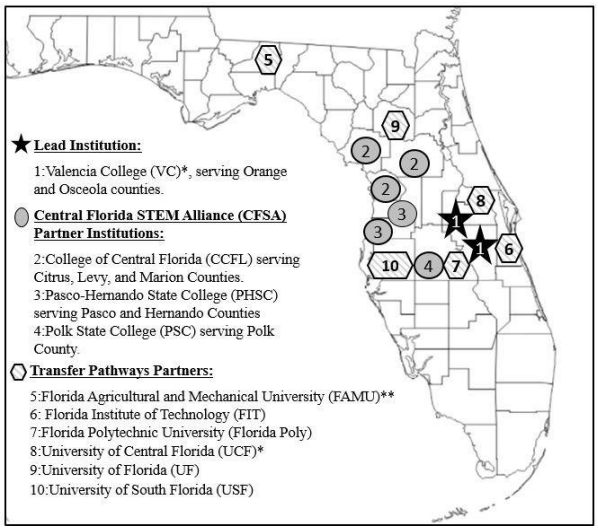
- Alliance institutions have demonstrated increased collaboration in the last report year, not only with each other and programs at their institution, but also with partner institutions, such as other local colleges, to provide increased opportunities to students.

- LSAMP has triggered increased focus on undergraduate research at the alliance institutions. While Valencia College already had undergraduate research opportunities on its campuses, research is more limited at the other partner institutions. The CFSA is engaged in robust discussions focused on coming up with solutions to expand valuable research opportunities to more students.

Chapter One: Introduction

Project Background

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to the Baccalaureate (B2B) funding from the National Science Foundation, seeks to strengthen the STEM educational ecosystem in Central Florida to support historically underrepresented minority (URM) students. This ecosystem is an interconnected, intentional network striving to support STEM education and literacy and to enhance college readiness and success in STEM through engagement in proven and innovative strategies. This current project leverages the experience and success of the previously funded CFSA projects (HRD #1304966, HRD #1712683) and the comprehensive LSAMP model, while utilizing innovative, evidence-based strategies to maximize opportunities in STEM for URM, community college students. The project builds on the Alliance's previous experience and evidence of success in supporting URM student recruitment, retention, and progression to four-year STEM degree programs. Valencia College (VC), a designated Hispanic-Serving Institution (HSI), collaborates with community college partners, the College of Central Florida (CF), Pasco-Hernando State College (PHSC), and Polk State College (PSC).



Program Design

The LSAMP program focuses on strengthening URM students' sense of belonging and deepening their engagement in STEM, using an activity framework designed to build engagement along the STEM pathway by integrating student, faculty, and institutional efforts. The framework is discussed in detail in the following section.

Student-Focused Activities

Student focused activities are comprised of six primary areas described below.

Summer Bridge Program

Graduating high school seniors and first-time-in-college students will participate in a summer bridge experience—the Summer STEM Institute—which will include workshops and presentations by STEM professionals and college/university faculty. Using technology to offer a virtual or hybrid summer bridge experience, the summer bridge program will promote alliance-wide student engagement and equitable access. Students will engage in hands-on STEM activities, learn about STEM career pathways, and discover resources and tools at their institutions to support their college readiness and success. Students will explore the connections between STEM and societal challenges by learning about the UN Sustainable Development Goals (UN-SDGs) and developing projects that support attainment of the UN-SDGs in their local communities.

Graduating high school seniors participating in the Summer STEM Institute will be required to complete a mathematics assessment to determine appropriate placement at their math skill level. Such assessment may include taking the mathematics portion of Florida's Postsecondary Education Readiness Test (P.E.R.T.), submitting ACT or SAT scores, or other institutional-specific assessments utilized by CFSA partners for math course placement. All participants must meet with a dedicated STEM advisor and discuss their appropriate math course placement. Where possible, CFSA colleges may utilize institutional resources to provide a math course waiver to students who successfully complete all requirements of the Summer STEM Institute, including specific math advising and completion of standardized test/assessments. This incentive will encourage students to accelerate progress toward completion of the math sequence with a right start in the first course.

Student Recruitment and Engagement

As part of the LSAMP strategy to recruit and engage LSAMP students in workshops and learning opportunities that foster STEM socialization, professionalization, and academic success, all students new to LSAMP will participate in an orientation—either through the Summer STEM Institute or through a dedicated orientation offered during the summer, fall and spring semesters. To join LSAMP, students must be enrolled at their CFSA institution, and registered as a degree-seeking student with demonstrated intent to major in STEM (non-health sciences). LSAMP seeks to ensure that at least 90% of all LSAMP students belong to racially and ethnically minoritized groups. All LSAMP students will be assigned a designated STEM Advisor. Upon completing orientation and enrollment, students will participate in LSAMP activities, workshops, field trips and learning experiences. To remain eligible for LSAMP, students must meet with their advisor at least once and participate in at least three LSAMP experiences per enrolled semester, e.g., STEM Summit, peer-led student workshops, presentations led by STEM professionals, college tours, or other learning experiences.

Dedicated STEM Academic Advising

In alignment with the advising models at their institutions, dedicated STEM advisors will engage LSAMP students in a) academic planning including establishing an educational plan and transfer plan, b) identifying and preparing for CFSA engagement opportunities, c) referrals to other departments; and d) responding to retention concerns.

Student-led STEM Skill Building and Peer Support

LSAMP students, including Peer Coaches and STEM Club members, will lead presentations and engagement opportunities for other LSAMP students and the broader STEM community at their institutions. These workshops will be developed and facilitated for students by students on a range of topics such as guidance for engaging in undergraduate research, exploration of STEM and social justice issues, resume-building, and applying for summer Research Experience for Undergraduates (REUs). To support student socialization, build community and cultivate a sense of belonging within the LSAMP cohort, STEM Club members will facilitate informal sessions where peers can connect and discuss personal and academic achievements and challenges. Technology will be leveraged to create opportunities for LSAMP students to engage across CFSA institutions.

Further, LSAMP programming will increase instructional support for URM students in STEM through peer-led support in online and face-to-face environments through peer coaching, peer tutoring and study groups.

STEM Identity, Professional Experiences, and Conferences

The program will offer on-campus and virtual workshops featuring STEM professionals for college faculty and URM students to learn about STEM careers, enhance STEM identity and expand STEM networks. Each CFSA institution will promote STEM student community and support LSAMP student interaction, workshops, presentations by STEM professionals, and education and career opportunities. LSAMP team members will support students in gaining competence and confidence to compete for national research and internship opportunities.

The program will host an annual alliance-wide conference, the STEM Summit, for LSAMP students to engage with STEM professionals, learn about STEM transfer options, and support student researchers in presenting their work. CFSA will collaborate with other students, mentors, institutions, and partners throughout the community to facilitate the STEM Summit. CFSA Paths will invite LSAMP students to attend national STEM conferences and encourage and support them in submitting applications to present their research at these conferences. The program will also support college tours to four-year universities and offer in-person or virtual tours of research labs in STEM disciplines at these institutions. Students will learn about careers through in-person or virtual STEM tours/field visit experiences with industry partners.

STEM Professionalization Experiences through Paths to Engagement

Three distinct types of STEM professionalization experiences will be offered for LSAMP members:

LSAMP Research Scholars incentivizes URM students to deepen their STEM undergraduate research experience by becoming an LSAMP Research Scholar. Grant funds are allocated to provide performance-based awards of $500 for a semester-long experience, reducing the risk of financially-related student dropout and potential workload conflicts due to student employment. LSAMP Scholars will conduct research either on-campus or through an external placement with an industry or university partner. Research Scholars will engage in a minimum of 40 hours in an undergraduate research, internship, or lab experience, participate in cohort meetings, develop a research poster, and present their work at the LSAMP Showcase.

LSAMP Community Interns is a STEM and social-justice oriented program to provide students with opportunity to explore how their envisioned STEM careers may contribute to their communities while examining social justice issues in the places where they live, learn, and work. Students will improve their understanding and application of STEM knowledge and skills as they implement strategies to make a difference in their communities. Community Interns will be required to complete a minimum of 25 hours in an internship with a community partner, research a social justice issue connected to STEM, participate in cohort meetings, and present on their internship experience. Students completing the one-semester component will be awarded $300.

LSAMP Peer Coaches is open to students who have participated as LSAMP Scholars or Community Interns. Students who have completed this prerequisite may apply to mentor/ coach other LSAMP students, LSAMP Research Scholars, LSAMP Community Interns, incoming freshmen, and/or support the summer bridge program and mentoring students in their UN SDG projects. LSAMP Peer Coaches also lead/develop workshops and other opportunities for their peers. Peer Coaches will be awarded $500 upon successful completion of this one-semester component.

Mentors/coaches will engage in a minimum of 40 hours of peer support, attend cohort meetings, and create a capstone presentation highlighting their STEM Story to present at the LSAMP Showcase.

Faculty-Focused Activities

Diversity and Inclusion in STEM

LSAMP will offer professional development (PD) opportunities for faculty to support the engagement of URM students in STEM and undergraduate research, which may include workshops on equity, inclusion, growth mindset, and engagement strategies in the virtual setting. The PD opportunities will be promoted in in-person and virtual format across the CFSA partner institutions to encourage faculty to participate.

Faculty and Staff Engagement

Faculty and staff engagement is expected in three areas: 1) co-curricular activities, 2) CFSA work groups and implementation teams, and 3) the peer community.

*Co-curricular Activities***:** Faculty will engage with LSAMP students as research mentors, and participate in the Summer STEM Institute, STEM Club, conferences, field trips and other enrichment activities.

CFSA Work Groups and Implementation Teams: Faculty and staff will participate in work groups around assigned project goals, and institution-specific LSAMP implementation teams will inform decision-making and programmatic planning for the CFSA.

Faculty Advocacy and Peer Community: Faculty will have opportunities across the CFSA to learn from one another through discussion and information sharing on research mentoring to support faculty who are serving as mentors for the first time. Technology will be utilized to allow faculty and staff mentors across the alliance to participate.

Department/Institution Focused Activities

STEM Articulation and Data Sharing Agreements

CFSA will support development of specific articulation agreements with expanded university partners and will work with university partners to articulate clear STEM degree pathways so that students can experience a seamless transfer process to their baccalaureate institution of choice. Data sharing agreements support consistent processes for receiving and analyzing accurate transfer data.

Data Taskforce

The Assessment and Evaluation work group consists of representatives from partner institutions that are developing data sharing agreements that will align definitions and data reporting systems to accurately capture and identify URM students in STEM pathways. This work group meets regularly and is supported by the project's PI, Co-PIs, Steering Committee, and Institutional Research Offices.

Study Design

The study design includes (a) a fidelity of implementation evaluation to determine how well the intervention is implemented compared to the original program design; (b) a process monitoring evaluation to provide program feedback; and (c) an evaluation to determine progress on the intended outcomes of the project.

The fidelity of implementation evaluation monitors activity-level (i.e., student focused, faculty focused, department/institution focused) indicators, using these to determine correlations to short-term student outcomes during the program (e.g., student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate).

The process monitoring evaluation uses a mixed methods approach to collect information that identifies barriers or challenges that have impacted implementation, track improvement in service delivery, and assess the overall reach of the services provided. It also identifies actions taken by project staff to ensure the sustainability of strategies/activities beyond the grant funding period.

Finally, the outcome/effectiveness evaluation utilizes both quantitative and qualitative data to identify student, faculty, and institutional impacts from the CFSA project. It includes 10 strategic indicators across two goals. It also explores the relationship of fidelity of implementation to mid-erm and long-term student outcomes at and beyond graduation (e.g., graduation rate, transfer rates, STEM self-efficacy and identity, sense of belonging). Several indicators will also be used for a quasi-experimental design study utilizing a comparison group to establish a cause-and-effect relationship between engagement with the LSAMP program and those indicators.

Project Goals and Objectives

The project goals and objectives below were presented in the CSFA Paths grant application to NSF.

Goal 1: LSAMP, underrepresented minority, STEM students are better prepared to succeed in STEM baccalaureate programs.	
Baseline Data:	The CFSA identified a baseline of 181 students participating in 30 or more hours of LSAMP activities in 2018-2019, evidencing deep engagement.
Objective:	By Year 3 (2024), the CFSA will 1) deeply engage URM students in 176 experiences as Community Interns, Research Scholars, and/or Peer Coaches supporting STEM professional experiences at alliance colleges and/or with university, industry, governmental, and community partners; and 2) support at least 24 additional URM students to participate in 30 hours of other activities promoting ongoing success in STEM as general LSAMP students.
Rationale:	The objective is ambitious yet attainable as the CFSA previously engaged 181 students in 30 or more hours of LSAMP activities. The number of deeply engaged and general LSAMP students is readjusting. The strategies for engaging students include diversified student roles as Community Interns, Research Scholars, or Peer Coaches. The CFSA will also use pandemic informed technology strategies to support virtual participation in LSAMP activities providing more opportunities for inclusion. Strategies will result in increased self-efficacy and development of a STEM identity and sense of belonging, preparing students for success in STEM baccalaureate degree programs.

Goal 2: Increase the number of underrepresented minority students who successfully transfer into STEM baccalaureate programs.	
Baseline Data:	The CFSA identified a baseline of 451 student transfers into STEM baccalaureate programs, which is the median of four years of CFSA student data (2016/17 – 2019/20).
Objective:	By Year 3 (2024), the CFSA will achieve a 30% net increase over the baseline number of successful URM transfers into university bachelor's degree STEM majors. The objective will examine the net value of transfers over the grant period.
Rationale:	The objective is supported by the baseline data, a median point for four years of data, but moderated to account for the effects of the CFSA restructure (new, fourth community college partner) and the global pandemic. Historic data indicates regular fluctuations in transfer data year to year, but the pandemic will have a significant impact on student enrollment and transfer, particularly in URM student populations (National Student Clearinghouse, 2020). The objective is ambitious as community college undergraduate enrollment is down 9.4% nationally, yet attainable as the CFSA increased the number of transfers by 53% from the Year 1 baseline during the previous project period and will build upon comprehensive, evidence-based approaches supporting student transfer.

Theory of Change and Logic Models

The Theory of Change (ToC) provides a graphic representation of how change will occur in the program and the basic assumptions being made in the theory and evaluation. The purpose of a ToC model is to test plausibility and is the foundation for the program logic model.[1]

The challenges or needs the program addresses focus on building STEM[2] pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.[3] Contributing to these larger challenges are a lack of preparation, low sense of belonging, low STEM self-efficacy, lack of inclusion of social justice components, work commitments, and lack of funding to support high-impact practices at two-year institutions. The program employs social justice STEM learning, experiential learning, partnerships to address student needs, programming to build STEM self-efficacy, STEM identity, and sense of belonging with the aim of increasing student transfer rates to four-year baccalaureate degree programs and increased success as STEM students at four-year institutions (Appendix A).

Evaluation Framework

The evaluation framework is based on the logic model and provides an overview of the evaluation plan by mapping the evaluation questions to expected outcomes, the data needed, the instrument to collect the data, and the analytical methods. The evaluation uses a mixed methods approach to

[1] Lisa Wyatt Knowlton and Cynthia C. Phillips (2012), The Logic Model Guidebook, London, Sage Press, Chapter 1.

[2] "STEM education" is defined as teaching and learning in the fields of science, technology, engineering, and mathematics. It typically includes educational activities across all grade levels— from pre-school to post-doctorate—in both formal (e.g., classrooms) and informal (e.g., afterschool programs) settings. H. Gonzalez and J. Kuenzi (2012), Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer, Washington, DC, Congressional Research Service. https://sgp.fas.org/crs/misc/R42642.pdf.

[3] Historically underrepresented minority students are defined as Black or African American, Hispanic or Latino, and American Indian or Alaska Native students.

fully understand the implementation context and triangulate data. The evaluation study is guided by three types of evaluation questions: fidelity of implementation, process monitoring, and outcomes.

Data Sources

During the grant-term, data is collected to measure the extent to which the goal and associated indicators are being met or are on track to be achieved. This provides CFSA with the information needed to adjust strategy or redeploy resources to accomplish their goals. Data sources available for the Year 2 report (Spring 2022 through Fall 2022) included qualitative data from site visits, institutional research data (e.g., GPA, persistence, retention), student survey data (i.e., baseline, annual, pulse), student feedback form data, and implementation data from each of the partner institutions. A description of each of the available data sources follows. Copies of instruments and protocols are included as part of the evaluation plan in Appendix A.

Site Visit Data

The evaluator made an in-person site visit at each CFSA institution for one day in February 2023. Site visit components included a student focus group, faculty/staff focus group, and a project staff interview. Some project directors planned additional student or faculty/staff focus groups and held them virtually to accommodate participants from other campuses and those unable to attend in person. Other LSAMP teams added campus tours, lunches with LSAMP faculty, staff, and students, and STEM Club meeting observations.

Baseline Student Survey

The Baseline Student Survey was initially administered in Year 1 to LSAMP students during February and March 2022. After the initial administration, the survey was continuously collected as students joined LSAMP. Table 1 presents the number of responses each term by institution.

Table 1. Baseline Student Survey Responses per Term, by Institution

Institution	Spring 2022	Summer 2022	Fall 2022	Spring 2023 (Jan-Feb)	Total
College of Central Florida	6	1	1	2	10
Polk State College	15	1	3	17	36
Pasco-Hernando State College	0	4	4	0	8
Valencia College	17	9	23	18	67
Total	**38**	**15**	**31**	**37**	**121**

Of these responses, 88 were included in the analysis. Of the 33 that were not included, 27 were incomplete and the other seven were duplicate responses where students took the baseline survey instead of the annual survey. The duplicate responses were analyzed with the annual survey.

Annual Student Survey

The Annual Student Survey was conducted for the first time in January 2023. The survey was left open for another month to garner additional responses. Only 11 students completed the survey (reflecting a low response rate of only 10%). The seven responses to the baseline survey were added to the annual survey for analysis.

Pulse Student Survey

The Pulse Student Survey was administered for the first time in December 2023. The survey was left open for two months to garner additional responses. Student response to this survey was also low, with only 14 completing it (8% of LSAMP members).

Summer Bridge Feedback Form

The Summer Bridge Feedback Form was administered in Summer 2022 and left open for another month to allow for additional responses. In total, 13 students completed the form (42% response rate).

General Event Feedback Form

Students were asked to complete this form at the end of any LSAMP event, beginning in in February 2022. Year 2 responses are included in this report. Table 2 presents the number of responses each term by institution.

Table 2. General Event Feedback Form Responses per Term, by Institution

Institution	Spring 2022	Summer 2022	Fall 2022	Spring 2023 (Jan-Feb)	Total
College of Central Florida	4	1	4	9	18
Polk State College	11	0	3	16	30
Pasco-Hernando State College	0	0	3	5	8
Valencia College	39	18	43	13	113
Total	**54**	**19**	**53**	**43**	**169**

Implementation Data

From Spring 2022 to Fall 2022, the partner institutions were expected to submit implementation data each term from. Data sources included an advising log, engagement opportunity log, faculty log, student activity log, STEM professionalization log, and detailed implementation log.

Chapter Two: Findings on Alliance Implementation

Evaluation findings are organized by the research questions and divided into two categories. Fidelity of implementation and process monitoring are explored concurrently. The outcome analysis is presented in the section that follows.

Fidelity and Process Evaluation

The guiding questions related to fidelity of implementation and process monitoring are:

Fidelity of implementation questions:

1. To what extent were the key components of the CFSA Paths Activity Framework implemented with fidelity?

2. What was the amount of variation in implementation fidelity?

Process monitoring questions:

1. What successes has the project achieved? Which project component is considered to be most closely associated with this success?

2. What challenges has the project faced and what actions were taken in response? Which component of the project is considered to be most closely associated with this challenge?

3. What factors (internal or external) have affected project implementation? What were the impacts of these factors on implementation?

4. What steps have been taken by the institutions that demonstrate a commitment to sustainability or institutionalization of grant-funded personnel, programs, and services?

Specifically, this section discusses activities implemented by the LSAMP program focused on students, those targeted to faculty/staff, and activities focused at the department/institution level. The section further explores which activities have been successful or challenging and the factors that affected their implementation. Implementation data were reviewed and compared with the original project plan as outlined in the funding application. The remaining fidelity question, which explores the relationship of fidelity of implementation to short-term outcomes, is discussed in the outcome analysis section (see p. 61). Information about the fidelity of implementation assessment is presented in the report. Findings include data from the first and second year of implementation, Spring 2022 through Fall 2022.

Documentation from Spring 2022 through Fall 2022 demonstrated that the alliance made progress with student-focused activities, particularly in the recruitment of LSAMP members, implementation of all student-focused project components, planning a variety of engagement opportunities, and implementing STEM professionalization opportunities. Alliance partners also made progress with faculty-focused activities by holding consistent meetings of the CFSA and generating new lists of work groups. See Appendix B for a full breakdown of fidelity of implementation by indicator.

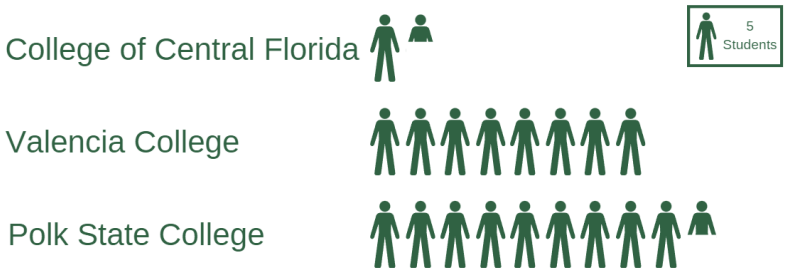
Student Focused Fidelity

Student-focused fidelity is comprised of 12 different areas. Institutions made progress recruiting and engaging students in various activities throughout the year. From Spring 2022 to Fall 2022, alliance partners also implemented the 2022 Summer STEM Institute, the 2022 STEM Summit, and numerous experiences to increase student professionalization in STEM. The following sections detail implementation across the alliance and variation amongst the institutions.

Student Recruitment

Across the alliance, 177 students were recruited as LSAMP participants by Fall 2022.[4] This represents a substantive increase over the 99 LSAMP students reported in the first annual report. All four alliance institutions successfully recruited LSAMP scholars in Year 2. As reported previously, Pasco-Hernando State College was unable to recruit members in Year 1 as they needed to focus on hiring staff and building institutional capacity to implement LSAMP. Success with recruitment efforts varied across institutions and was related to staff capacity and how long LSAMP had been an established entity on their respective campus. Figures 1 and 2 below show the increase in LSAMP members by institution from Year 1 to Year 2.

Figure 1. LSAMP Members by Institution, Fall 2021



LSAMP membership across the alliance increased to a total of 177 total participants by Fall 2022. Similar to the Year 1 report, Valencia College and Polk State College had the most members, as these institutions have been in the alliance the longest (Figure 2; See Table 1, Appendix B).

[4] The 177 official tally of LSAMP members in Fall 2022 is based on data provided by the institutions. This does not include students who were served by advisors or in STEM Clubs but were not in LSAMP.

Figure 2. LSAMP Members by Institution, Fall 2022

Pasco-Hernando State College, the newest institution to the alliance, recruited nine LSAMP members by Fall 2022. Project staff successfully recruited all three participants in the Summer STEM Institute to be LSAMP participants in Summer 2022. Another recruiting effort for the college was the STEM Summit. Since the STEM Summit was virtual last spring, the alliance allowed PHSC to use it as a recruiting tool. To encourage participation, some math professors offered extra credit to students who attended the STEM Summit. Additional recruitment efforts during the year included emailing potential URM students and sharing information about the alliance with STEM faculty at all campuses through a presentation and letter.

The College of Central Florida, the second newest institution, had seven LSAMP members by the end of Fall 2022. Project staff aim to recruit more students but noted that they were frequently recruiting students in their second year and that by the time students participated in LSAMP, their time at College of Central Florida was nearing the end. Project staff at the partner institutions agreed this is one of the challenges of being a two-year college. An additional challenge is that Associate of Science degrees in certain majors are not on the list of NSF-recognized STEM disciplines for LSAMP. The College of Central Florida has a large, highly-ranked[5] nursing program and other biomedical programs; although some of these students are active in the college's STEM Club, they are ineligible for LSAMP.

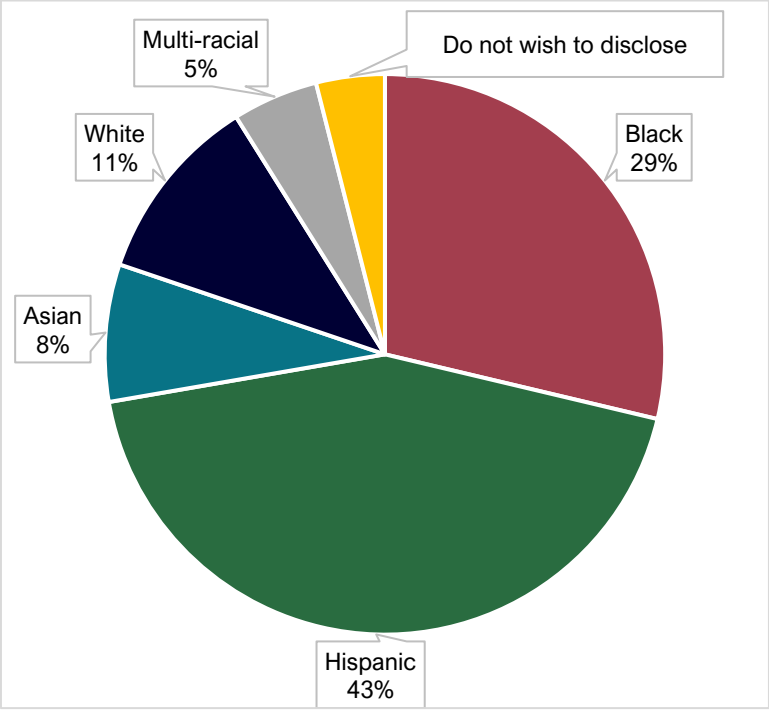
Valencia College successfully recruited 75 LSAMP scholars by Fall 2022, an increase of 35 members over Year 1. With an LSAMP advisor and STEM Club at three of their campuses (i.e., Osceola, West, East), the college has the capacity to serve more students than the other partners in the alliance.

Polk State College recruited 93 LSAMP members by the end of Fall 2022. In Year 1, project staff had to shut down recruitment due to budgetary and staff capacity limitations Although a staff member affirmed, *"we do have a lot of students that want to be part of LSAMP,"* they explained that part of the challenge was that with 53 students, the advisor was at capacity (serving as both LSAMP academic advisor and STEM Club advisor). However in Year 2, a faculty member agreed to serve as Program Coordinator. This, combined with limiting the LSAMP application period to the first two weeks of each term, has enabled the LSAMP program to serve more students.

[5] RegisteredNursing.com ranks the College of Central Florida's Citrus Campus Nursing Program as the top in the state (https://www.registerednursing.org/state/florida/#rankings).

Of the 177 students recruited as of Fall 2022, 72% belonged to racially and ethnically minoritized URM groups. The alliance's goal is for 90% of LSAMP members to be from these groups. A majority of students identified as Hispanic (*n*=78) or Black (*n*=51). No students identified as Native American or Native Hawaiian or other Pacific Islander, as shown in Figure 3.

Figure 3. LSAMP Member Demographics, Fall 2022 (*n*=177)



Note: Demographic data for the College of Central Florida were not available at the time of this report.

Demographics in Fall 2022 were similar to demographics reported at the end of Year 1 for Spring 2022, with 43% of students identifying as Hispanic (*n*=44) and 29% identifying as Black (*n*=29). Notably, the percentage of students who identified as White decreased from 16% (*n*=16) in Spring 2022 to 11% (*n*=19) in Fall 2022 (Figure 4).

Student Focused Fidelity 3.2

Indicator: At least 90% of all LSAMP students belong to racially and ethnically minoritized groups.

Alliance Status: Not Met

As of Fall 2022, 72% of LSAMP members belonged to racially and ethnically minoritized groups.

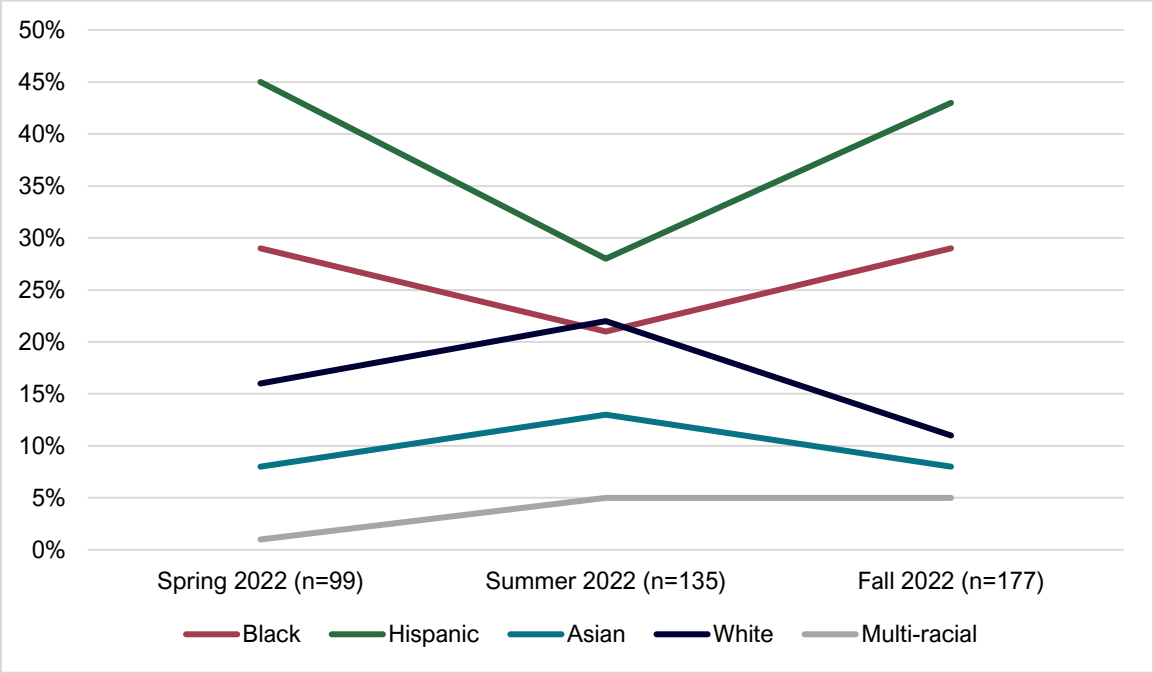
Institution Status: Not Met

The percentage of students who belonged to racially and ethnically minoritized groups in Fall 2022 varied by institution from 66% to 75%. The indicator was not met at any institution.

Comparison to Baseline: In Fall 2021, 72% of students were from racially and ethnically minoritized groups. While there was an increase in LSAMP members by Fall 2022, the percentage of members from URM groups did not change.

More information can be found in Appendix B, Table 4.

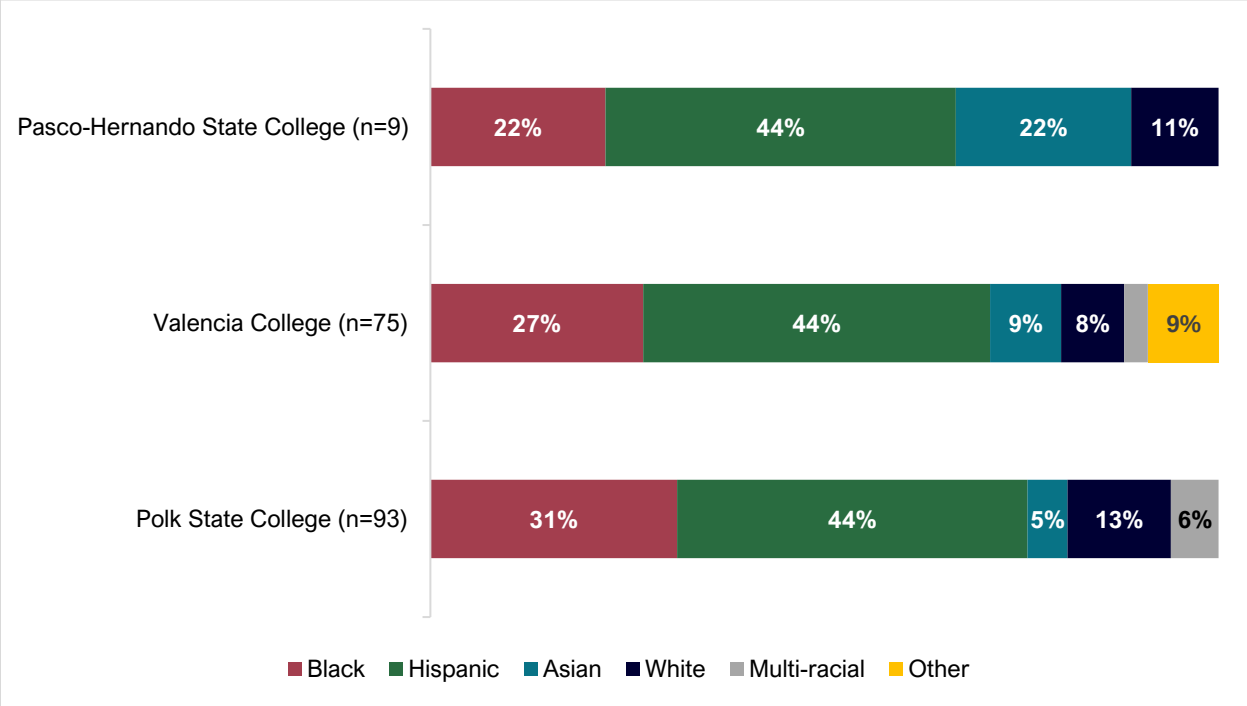
Figure 4. LSAMP Demographics, Spring 2022 to Fall 2022



Note: Demographic data for the College of Central Florida were not available at the time of this report.

The percentage of students who belonged to racially and ethnically minoritized groups in Fall 2022 varied by institution from 66% to 75%. This represents a decrease over the prior year's percentage range of 14% to 83%. Figure 5 includes a full demographic breakdown.

Figure 5. LSAMP Member Demographics by Institution, Fall 2022



Note: Demographic data for the College of Central Florida were not available at the time of this report. Further, the percentage of Valencia College students identifying as multi-racial was less than 5%.

Institutions share a common challenge that impacts their recruitment efforts. LSAMP staff have found it difficult to bring students into the program early enough in their time at the partner institutions. Most students typically spend only two years at community college institutions. One staff member explained the need for better information sharing about the program and the need to connect with students early in their academic pathways:

> *Because we are such a large, spread-out commuter college, students are likely going to have a harder time connecting to a college culture. There has to be an intersect at an early point to inform students about these options [such as LSAMP]… We found that some students don't even hear of programs until too late in the process; they don't hear about LSAMP, don't hear about [other campus programs], not even Honors sometimes.*

Figure 6. Polk students, faculty, and staff recruiting LSAMP members at a campus event.

All the LSAMP institutions engage in similar recruiting strategies such as tabling at campus-wide events, club fairs and at other campus happenings where students congregate. Word-of-mouth seems to be another effective recruitment method. Students have reported hearing about LSAMP through STEM faculty, their academic advisors, other LSAMP scholars, and their STEM Club advisor. For example, students shared that an advisor at Polk State College walks around campus encouraging students to come to a STEM Club meeting and join LSAMP. To prepare faculty and staff to promote the LSAMP opportunity with students, the team at each institution strives to disseminate practical information to its faculty and staff in targeted ways. As previously noted, Pasco-Hernando State College conducted a presentation with faculty and staff and sent out letters to on the benefits of the LSAMP. Members of the LSAMP teams at several institutions attend advising meetings to ensure that advisors are up to date on the program.

Figure 7. Students at the College of Central Florida tabling at their Club Rush event to recruit students to STEM Club and LSAMP.

Further, institutions have LSAMP information sessions or share about LSAMP through their STEM Clubs, which can be a good method for recruiting students. Each institution has a functioning STEM Club. Three of Valencia College's campuses (i.e., Osceola, West, East) have an active STEM Club. While the STEM Clubs are part of LSAMP, they also serve students who are not in LSAMP. Sometimes, students only learned about LSAMP after joining their institution's STEM Club.

Some institutions have successfully leveraged other programs in support of their recruitment efforts. Valencia College partners with Valencia Engaging for Completion Through Opportunities in Research (VECTOR),[6] an NSF-funded project that provides students interested in STEM with scholarships, faculty support, and research experiences. VECTOR Scholars are strongly encouraged to attend the Summer STEM Institute (held by LSAMP) according to the VECTOR website.[7] VECTOR Scholars are also required to have an undergraduate research experience, either by completing the Valencia Honors Research Course (IDH 2912) or joining LSAMP and completing a research project through the Research Scholar component. The similar goals of these two programs enable project staff of each program to collaborate on sharing opportunities with prospective students.

Similarly, Polk State College partners with their TRiO Support Services program on recruitment. This program supports underrepresented students (i.e., first-generation, low income, students with disabilities) to persist at Polk, graduate, and ultimately transition to a four-year college or university. Project staff explain that one benefit of participation in TRiO is the opportunity to go on a variety of college tours. This is an exciting aspect of LSAMP participation but can only be offered sparingly due to funding.

Pasco-Hernando State College, the newest institution in the alliance, has begun to partner with their College Reach Out Program (CROP).[8] This program targets low-income students in grades 6-12. Upon successful completion of CROP, students are admitted to PHSC. By identifying high

[6] https://valenciacollege.edu/finaid/programs/scholarships/vector
[7] https://valenciacollege.edu/finaid/programs/scholarships/vector/about-vector.php
[8] https://equity-services.phsc.edu/students/pre-collegiate/college-reach-out-program

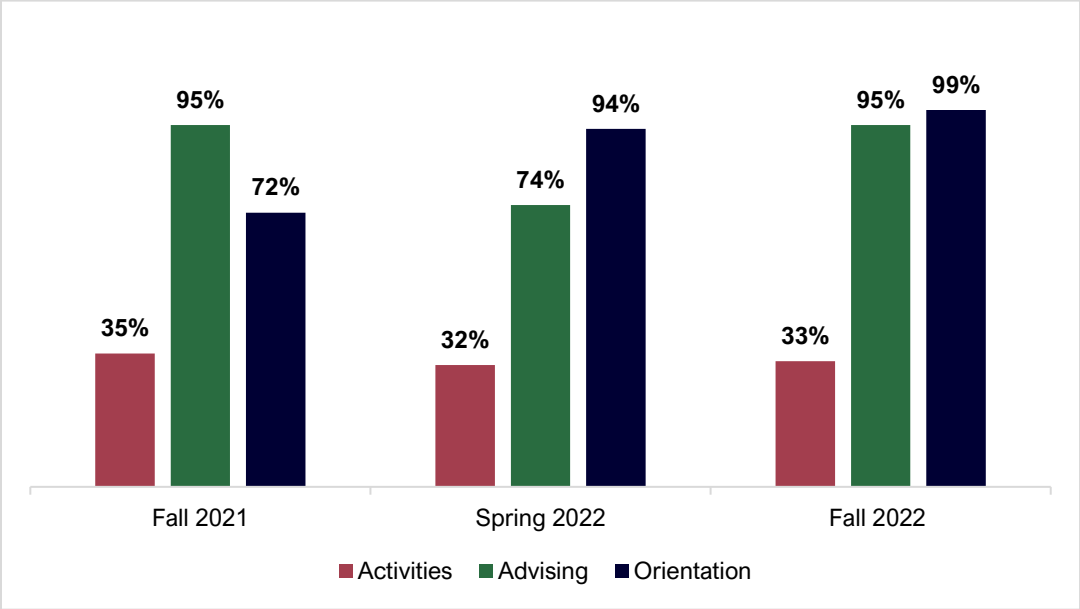
school students who are interested in STEM fields, project staff are able to share the LSAMP opportunity with them and strongly encourage them to apply.

Like Pasco-Hernando State College's recruitment of high school students through the CROP program, Polk State College also recruits high school students through an annual luncheon of local high school counselors. During this luncheon, project staff actively share information about the benefits of the LSAMP program. The College of Central Florida plans to begin recruiting efforts with high school students by sending STEM Club advisors and LSAMP members to local schools to share about the opportunity.

Engagement

To remain an LSAMP member, students are required to meet with their advisor at least once per term and participate in at least three LSAMP-recognized activities or experiences per term. Students are also expected to complete LSAMP orientation in their first term. The percentage of students completing each of these requirements has varied across the first two years, as shown in Figure 8.

Figure 8. Percent of Students Completing LSAMP Requirements, by Term

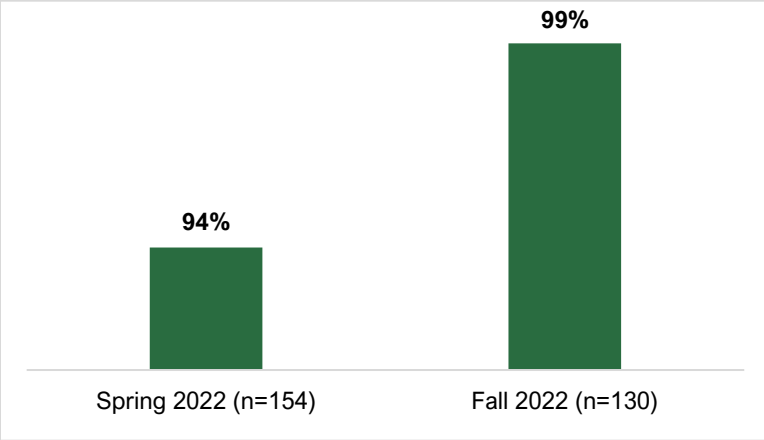


Note: Advising data from Polk State College were not available at the time of this report. Further in all semesters, some students who were not LSAMP members (but were served by the advisors or were in STEM Club) were included in the data set and ultimately the analysis. Further, data sources varied in the number of students reported across the alliance. In fall 2021, the number of students in each data source was 116-150. In Spring 2022, the number of students in each data source was 101-154. In Fall 2022, the number of students in each data source varied from 130-149. The individual sections below and Appendix B present exact counts.

Orientation

Students are required to participate in LSAMP orientation once accepted into LSAMP. Each alliance institution offers its own orientation session to fulfill this requirement. In Fall 2022, 99% of members (*n*=129) completed orientation, representing a slight improvement from the 94% of members (*n*=145) who did so in Spring 2022 of the prior academic year (Figure 9).

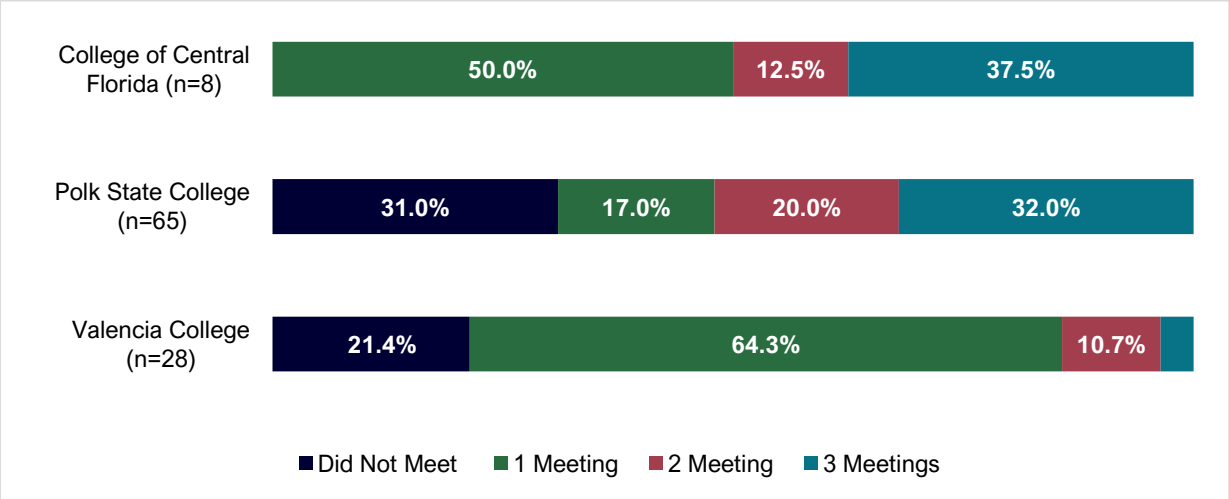
Figure 9. Percentage of Members Completing Orientation by Term



Advising

LSAMP scholars are required to meet with their advisor at least once per semester. Advisors kept logs to document this aspect of the program. Based on this information, 74% of students (*n*=75) met with their advisor at least one time in Spring 2022 (Figure 10).[9]

Figure 10. Number of Advising Meetings by Institution, Spring 2022



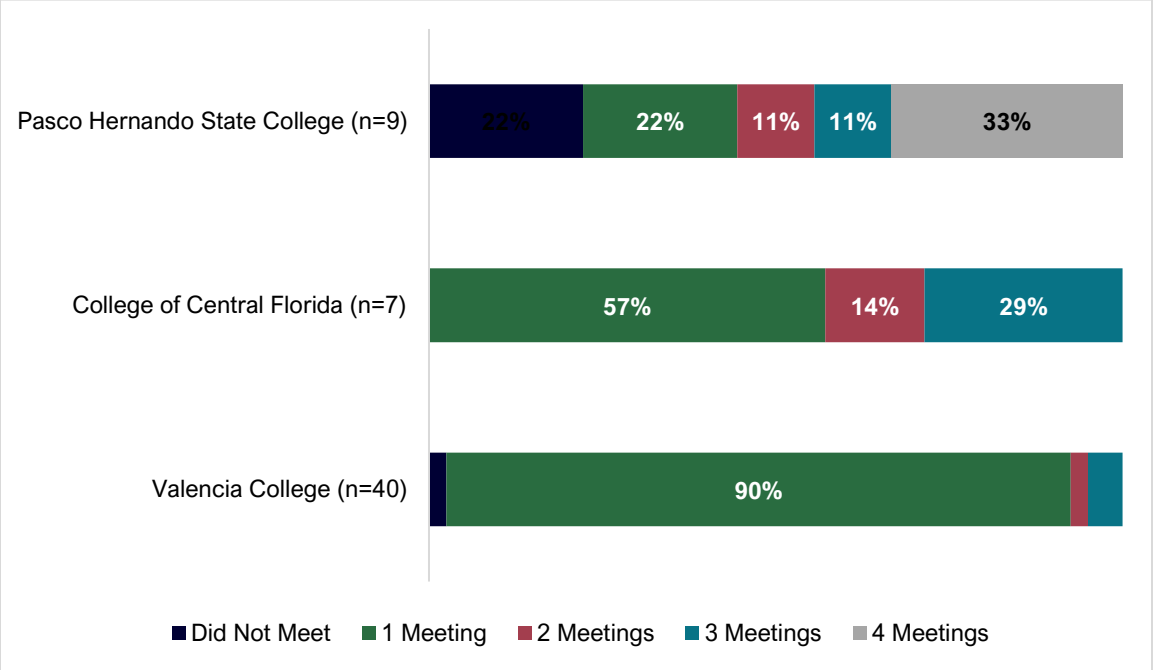
Note: Less than 5% of Valencia College LSAMP students had three or more advising meetings.

The percentage of students who met with their advisor at least once in Spring 2022 varied. In fact, at Valencia College 21% of students (*n*=6) and at Polk State College 31% of students (*n*=20) did not meet with their advisor in Spring 2022. The cause of this remains unclear, as this trend did not match the data provided for Fall 2021 and Fall 2022 (see Figure 8). In Fall 2022, the percentage of students meeting with their advisor at least once increased to 95% (*n*=53;

[9] Advising log data was missing for 12 students from Valencia College and 1 student from the College of Central Florida. Further, data were included for 12 students from Polk that were not LSAMP members.

Figure 11).[10] This was similar to the percentage of students completing this requirement in Fall 2021.

Figure 11. Number of Advising Meetings by Institution, Fall 2022



Note: Less than 5% of students had no advising meetings or 2 or more advising meetings at Valencia. Data were not available from Polk State College at the time of the report.

In Fall 2022, only Pasco-Hernando State College had significant variation in the percentage of students who met with their advisor at least once (22% of students, *n*=2 did not meet with their advisor). However, at Pasco-Hernando State College and the College of Central Florida, the percentage of students meeting with their advisors more than one time ranged from 33% to 55%.

It is important to interpret this data with caution given that advising logs at all the institutions were not maintained in the same manner and it is uncertain whether all advising meetings were tracked.

[10] Advising log data was missing for 44 students from Valencia College.

Students confirmed the value of LSAMP advising during the focus group, although the LSAMP advisor's scope and purpose varies by institution, as the following summary illustrates:

College of Central Florida. First-year students are assigned a first-year advisor. In their second year, students are assigned to the advisor for their meta-major. The STEM meta-major advisor serves a dual role as the LSAMP advisor. The college has implemented a StartSmart grant,[11] which moved the institution to a system of milestones and advising meetings. The STEM/LSAMP advisor meets with all STEM majors at the beginning of their second year.

Pasco-Hernando State College. New students receive advising in group format; drop-in virtual and in-person advising is available to them throughout their time at the college. Students are not assigned specific advisors. At PHSC, the LSAMP advisor works in tandem with other academic advisors. The LSAMP advisor meets with students after they register for classes to compare their schedule to the pre-requisites at their intended transfer university to ensure enrollment in appropriate classes. The LSAMP advisor confirmed that she helps students find college resources and sign up for opportunities (e.g., Research Experiences for Undergraduates).

Polk State College. Students are not assigned advisors and there is no major-specific advising. However, first-time in college students are assigned to a career success coordinator. The LSAMP advisor is a separate position at this college. He meets with students to support their academic and social-emotional needs. His supports include helping students register for classes, ensuring their courses satisfy pre-requisites at their intended transfer institutions, and accessing college resources and signing up for opportunities (e.g., Research Experiences for Undergraduates, conferences). The LSAMP advisor also monitors student grades and connects students with tutors as needed.

Valencia College. Generally, students have access to advisors as needed through virtual appointments or in-person at the advising center. Depending on the campus and the major, students may have access to a specific

[11] https://www.cf.edu/admissions/information-for-students/first-time-in-college/

Student Focused Fidelity 4.5

Indicator: Students are satisfied with dedicated STEM academic advising.

Alliance Status: In Year 2 (Spring 2022 to Fall 2022), 100% of students (*n*=7) were agreed or strongly agreed they were satisfied with academic advising.

Institution Status: Due to a low response rate, institution level data cannot be provided at this time.

Comparison to Baseline: Baseline data were collected for the first time in Year 2.

See Appendix B, Table 5 for more information.

Career Program Advisor, Program Advisor, or Specialized Advisor.

Valencia College has a dedicated LSAMP Advisor at three of their eight campuses that supports the student's academic needs. They guide students to campus resources, share opportunities with students, and monitor that the necessary pre-requisites are met for successful transfer. LSAMP advisors frequently speak with students about their social-emotional needs as well.

Despite the varied advising structures at the respective alliance institutions, students confirmed the value of having advisors in their comments during the focus group. One student explained the benefit of having both a college advisor and their LSAMP advisor:

> *They both know what their programs consist of, but there's always something that the other will give you that the other doesn't know. There is that and then there's also the different perspective that you can get, right? So I think it's good to visit both [advisors].*

This student felt their LSAMP advisor also helped by sharing opportunities. Their comment below provides an example of how the LSAMP advisor assists with class scheduling:

> *[My LSAMP advisor] walked me through every step. We looked at my pathway, then we looked at the classes I had to take and then we assembled a schedule that was reasonable for me with spaces between classes and time for me to drive there.*

Advisors were particularly helpful in ensuring that students were taking the right courses to satisfy transfer requirements. The comment illustrates how a well-informed LSAMP advisor can have a major impact on the scholar's academic pathway:

> *My regular advisor was trying to get me from point A to point B saying, "Oh, you don't need these classes for graduation." But when [my LSAMP advisor] saw my education plan, he said I need to be able to not only graduate but also graduate with the transfer requirements.*

The need for advisors with specific knowledge of transfer requirements was a significant theme during the evaluator's annual site visit. Students, faculty, and staff agreed on the importance of ensuring all pre-requisites were met, especially related to math coursework. With STEM degrees in particular, it is critical that all pre-requisites are met before the student's junior year as this ultimately determines whether students enter the transfer institution as juniors in their major or as freshman or sophomores.

Engagement in LSAMP Opportunities

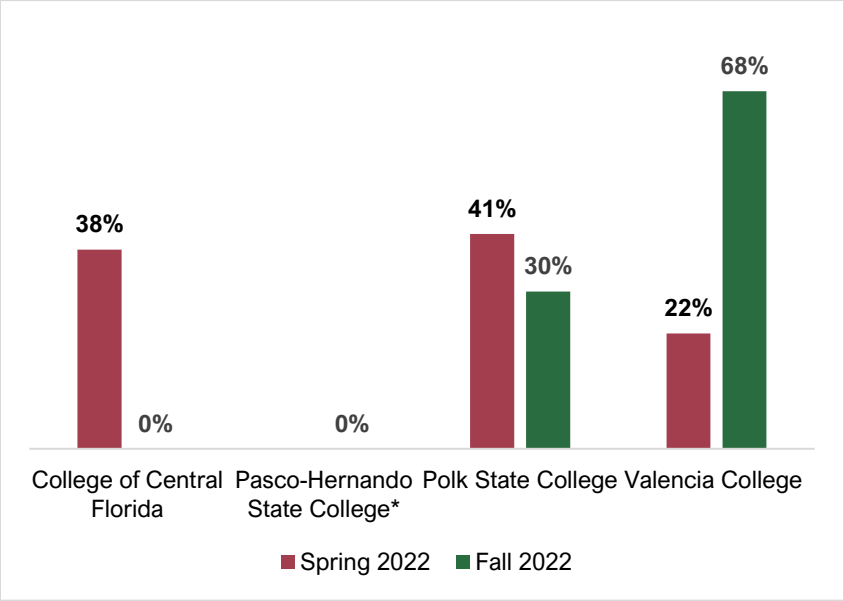
The percentage of students meeting the participation requirement ranged from 32-38% over the time period of the first two reports (Fall 2021 through Fall 2022). The evaluator suspects this may be related to students joining LSAMP later during the academic term and not having time to participate in three activities. Another contributing factor may be that some students included in the data set are STEM Club members but not LSAMP members and therefore do not have the activity-participation requirement.

While engagement varied by institution, Valencia College was the only institution where the majority of students met the participation requirement during Fall 2022. The majority of students did not meet participation requirements at any of the partner institutions in Spring 2022.

Three of the four partner institutions (except Pasco-Hernando State College, which did not have participating LSAMP students yet) held multiple events in Spring 2022. The College of Central Florida had seven, Polk State College hosted 21, and Valencia College held 61 events.

The College of Central Florida only reported holding one event in Fall 2022; however, during the evaluator's annual site visit, the STEM Club faculty advisor noted students met regularly but these meetings were not tracked as engagement opportunities. The evaluator will continue to work with project staff to refine data collection to gain a better understanding of student participation (Figure 12).

Figure 12. Percentage of Students Meeting the Activity Requirement, By Institution



Note: Please note that Pasco-Hernando State College did not have LSAMP members in Spring 2022.

Although engagement in activities was low across the alliance, students responded positively when asked about their experiences with LSAMP activities, describing them as fun, motivational, and beneficial. One student explained that LSAMP enabled them to have "*some projects on the side that you can do, to kind of not get discouraged and see the fun side of your*

Student Focused Fidelity 3.4

Indicator: Students participate in at least three LSAMP experiences per semester.

Alliance Status: In Spring 2022, 32% of LSAMP students (*n*=49) participated in at least three experiences. In Fall 2022, 33% (*n*=43) participated in at least three experiences.

Institution Status: In Spring 2022, the percentage of students meeting the requirement varied from 22%-41%. In Fall 2022, the percentage varied from 0%-68%.

Comparison to Baseline: In Fall 2021, 33% of students (*n*=52) met the requirement. The percentage of students meeting the requirement by term has decreased slightly (2%-3%) from baseline.

See Appendix B, Table 4 for more information.

major." Activities were also credited with providing students with information about STEM careers. One student characterized the workshops as "*really cool because I'm learning a lot more about different opportunities…in terms of my career path*."

LSAMP engagement opportunities often overlap with STEM Club activities and the STEM Clubs are attractive to students: "*This seems like one of the more active clubs here. I've joined other clubs here [at my institution] but this one is always consistent.*"

Figure 13. Polk State College students took a field trip to the Apollo Beach Manatee Viewing Center in Florida.

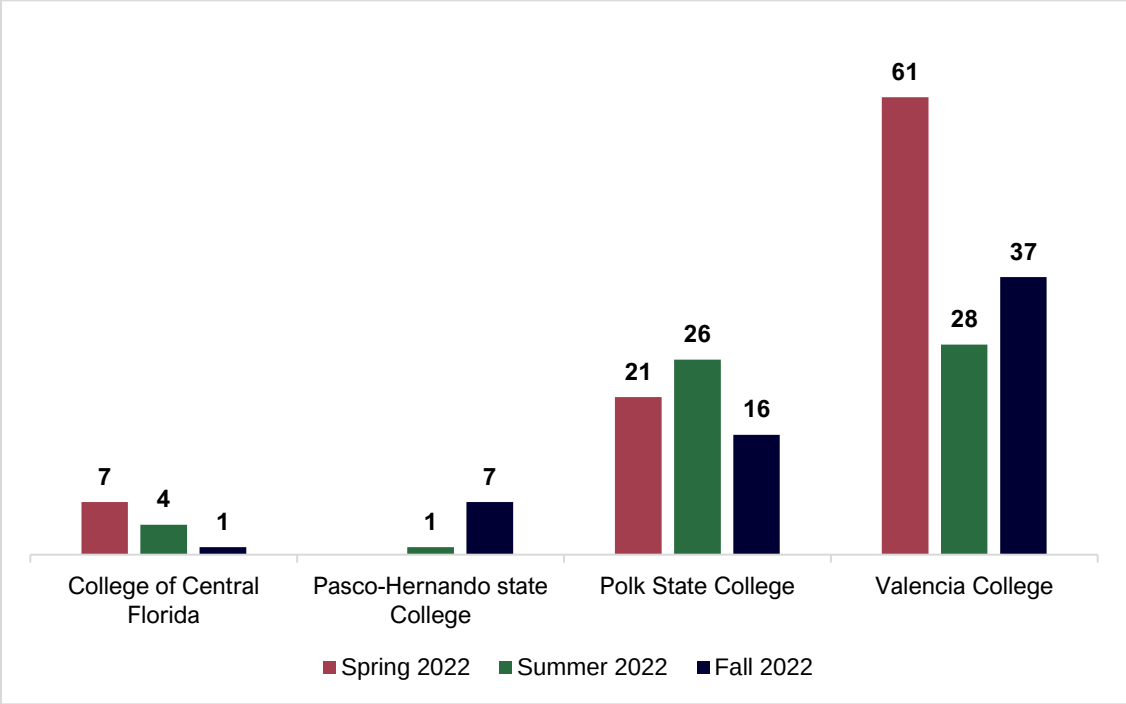
While engagement data was inconsistently captured, it is clear students are engaging in opportunities and have found LSAMP programming beneficial.

Engagement Opportunities

The range of student engagement opportunities that LSAMP programs provide includes STEM skill-building workshops, informal support sessions, workshops on STEM careers and identity, networking, conferences, and college and industry tours.

In Year 2 (Spring 2022 through Fall 2022), LSAMP offered 209 different opportunities across the alliance. However, the actual number may be higher because some activities (e.g., STEM Club meetings) were not consistently documented at some institutions. Figure 14 shows the breakdown of opportunities by institution.

Figure 14. Number of Engagement Opportunities, By Term



Students participated in workshops such as:

- The Nature of Science: Sandwiches, Mosaics and the Tragic Tale of Ignaz Semmelweis (College of Central Florida; Spring 2022)
- Creating High-Quality STEM Research Presentation Abstracts (Pasco-Hernando State College, Fall 2022)
- Earth Day STEM Speaker Series: Richard Henning (Polk State College, Spring 2022)
- Barrier Island Center Lunch & Learn Webinar: Sea Turtles & Microplastics (Valencia College, Spring 2022)

Figure 15. Students attend a workshop as part of a STEM Club meeting at Polk State College.

Students also attended field trips to colleges, universities, and industry partners such as:

- Institute for Human and Machine Cognition (IHMC), Pensacola, Florida (College of Central Florida/Valencia College, Spring 2022)
- Kennedy Space Center, Merritt Island, FL (Polk State College, Spring 2022)
- University of Central Florida, Orlando, FL (College of Central Florida, Fall 2022)

Student Focused Fidelity 7.1

Indicator: On-campus and virtual workshops help students learn about STEM careers, enhance STEM identity and expand STEM networks.

Alliance Status: In Year 2 (Spring 2022 through Fall 2022), a total of 27 workshops were offered.

Institution Status:

Institution	# of Opportunities
College of Central Florida	1
Pasco-Hernando State College	2
Polk State College	9
Valencia College	15

Comparison to Baseline: The number of opportunities increased from 17 in Fall 2021 to 27 in Year 2 (Spring 2022 through Fall 2022).

See Appendix B, Table 8 for more information.

Figure 16. Students from Valencia College and the College of Central Florida visiting IHMC.

Figure 17. College of Central Florida students visit the University of South Florida and tour a campus lab.

Students traveled to professional STEM-related conferences including:

- Community College Innovation Challenge Conference, Washington, D.C. (College of Central Florida/Polk State College, Summer 2022)
- Annual Biomedical Research Conference for Minoritized Scientists, Anaheim, CA (Valencia College, Fall 2022)
- Louis Stokes Midwest Regional Center of Excellence Conference, Schaumburg, Illinois (All Institutions, Fall 2022)

During the evaluator's annual site visit, students commented on the value they derive from attending conferences: "*They gave us direction. They told us if you want to get your PhD, this is how you do it. It gave me a sense of hope.*"

Figure 18. LSAMP members from across the CFSA at the Louis Stokes Midwest Regional Center of Excellence Conference in Fall 2022.

Students met regularly in STEM Clubs at each institution. More information about the type of activities offered can be found in Tables 6-10 in Appendix B.

In Year 2 (Spring 2022 through Fall 2022), faculty/staff members (55%) or a combination of faculty/staff or STEM professionals and students (37%) coordinated the majority of engagement opportunities across the alliance, as shown in Figure 19.

Student Focused Fidelity 9.1

Indicator: In-person and virtual lab tours are offered in STEM discipline areas at four-year research institutions.

Alliance Status: Seven different tours were offered from Spring 2022 through Fall 2022, with. some tours attended by students from more than one institution.

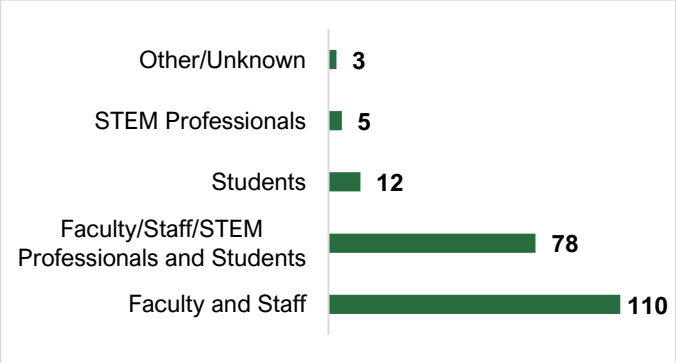
Institution Status:

Institution	# of Opportunities
College of Central Florida	2
Pasco-Hernando State College	0
Polk State College	6
Valencia College	2

Comparison to Baseline: Increase of seven opportunities from Fall 2022 (n=0) to Year 2 (Spring 2022 through Fall 2022;n=7).

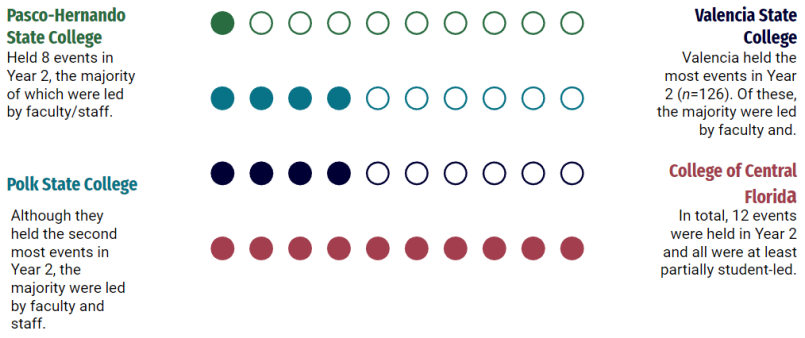
See Appendix B, Table 10 for more information.

Figure 19. Activity Leaders, Year 2 (Spring 2022 through Fall 2022)



Several fidelity indicators (i.e., 5.1, 5.2, 5.3, 6.2; see Appendix B) require students to lead activities. Overall, 43% of CFSA activities (*n*=91) were student-led. Figure 20 shows the percentage of activities led by students or a combination of students, faculty, staff, and STEM professionals by institution. All colleges had some activities led by students, but it varied widely. PHSC was on the lower end with 12.5% of events (*n*=1) led at least partially by students while Polk State College had students leading 44% of their events (*n*=28). About a third (37%) of events at Valencia College were led by students. Unlike the other partner institutions, students led 100% of events (*n*=12) at the College of Central Florida. The percentage of student-led activities is expected to increase as the LSAMP teams onboard Peer Coaches at their respective institutions (Figure 20; see SF 5.1, Table 6, Appendix B).

Figure 20. Percentage of Activities Led by Students



While the overall percentage of student-led activities has declined since the Year 1 report, the overall number of activities offered at CFSA institutions increased from 45 to 209. Time constraints in

Student Focused Fidelity 5.4

Indicator: Students are satisfied with student-led STEM skill building workshops and peer supports.

Alliance Status: In Year 2 (Spring 2022 through Fall 2022), 96% of students (*n*=44) were satisfied with student-led STEM skill building workshops and peer supports.

Institution Status:

Institution	% of students satisfied
College of Central Florida	100% (*n*=5)
Pasco-Hernando State College	N/A
Polk State College	91% (*n*=10)
Valencia College	97% (*n*=31)

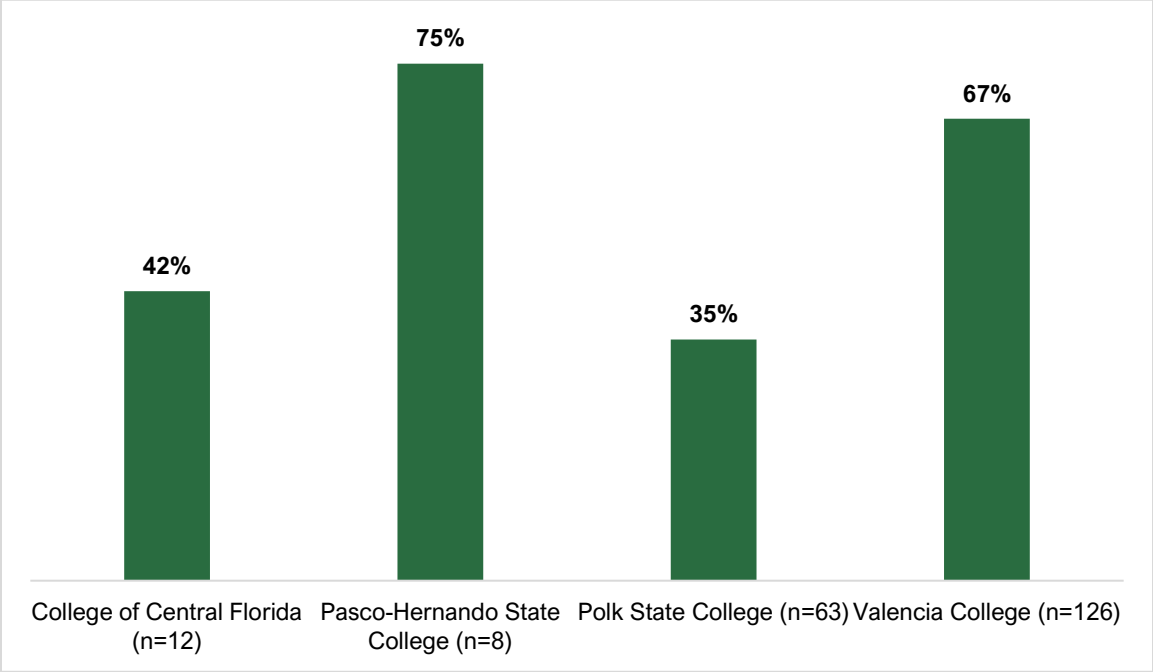
Comparison to Baseline: No feedback on this data point in Year 1.

See Appendix B, Table 6 for more information.

Fall 2021 limited the number of student-led activities that could be organized between October and December. Institutions had to focus on having the three engagement opportunities required per semester rather than ensuring the activities were student-led. LSAMP project staff also noted the challenge of getting students to lead activities. It was expected that student-led activities would increase in Year 2 with the implementation of peer coaching. However, only Polk State has successfully recruited students as Peer Coaches between Spring 2022 and Fall 2022. The challenge in this domain according to project staff is that students must be second-semester LSAMP scholars to participate in one of these opportunities (e.g., Research Scholar, Peer Coach, Community Intern). Further, being a Research Scholar or Community Intern is a prerequisite to being a Peer Coach. This requires recruiting students early in their programs at the colleges. The majority of students who have participated in STEM professionalization activities have chosen to do so as a Research Scholar. More information about STEM Professionalization opportunities is provided on p. 42.

In addition to tracking who leads activities, the modality of the activity is recorded. By including hybrid or virtual activities, the alliance seeks to engage students across institutions. Fifty-six percent of opportunities (*n*=117) were offered virtually across the alliance. Figure 21 shows the percentage of opportunities offered virtually by institution.

Figure 21. Percentage of Engagement Opportunities Offered Virtually by Institution

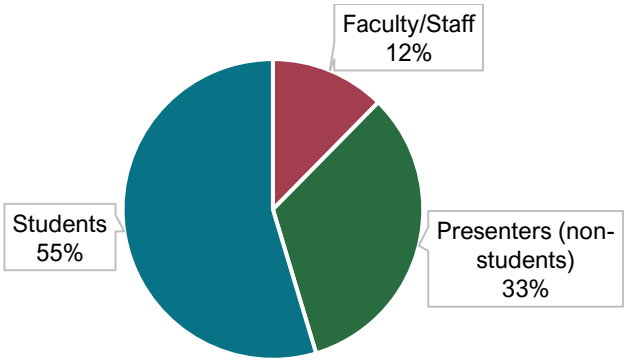


STEM Summit 2022

In Spring 2022, the alliance hosted a six-hour STEM Summit on April 15, 2022. This conference included a keynote speaker, panels, a virtual lab tour and two breakout sessions of varied workshops the participants could choose to attend according to their interests (Figure 24).

Due to continuing COVID-19 challenges, the conference format was virtual. Fifty-three students across the alliance attended the STEM Summit in April. Additional attendees included 32 non-student presenters and 12 faculty/staff members (Figure 22).

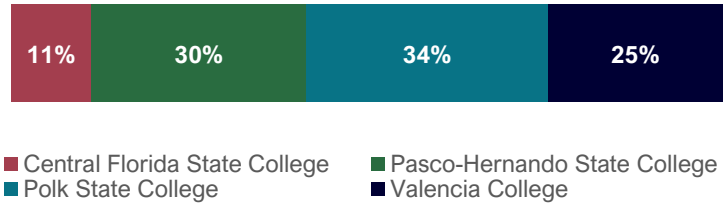
Figure 22. STEM Summit 2022 Attendees (*n*=97)



Note: All attendees listed here attended at least 30 minutes of the virtual conference.

Of the 53 student attendees, about a third each came from the College of Central Florida, Polk State College, and Valencia College, respectively. Pasco-Hernando State College was given permission to invite students to attend as a recruitment tool; 18 PHSC students did so (Figure 23).

Figure 23. STEM Summit 2022, Student Attendees by Institution (*n*=53)



Time participating in this virtual event was tracked by project staff to ensure accurate participation data. Seventy-four percent (*n*=63) of the attendees were present for 1.5 hours or more and 64% (*n*=54) attended for more than two hours.

Student Focused Fidelity 8.1

Indicator: STEM Summit, an alliance-wide conference, is held annually.

Alliance Status: In Spring 2022, 53 students attended the STEM Summit All institutions participated in the Spring 2022 STEM Summit.

Institution Status:

Institution	# of Students
College of Central Florida	6
Pasco-Hernando State College	16
Polk State College	18
Valencia College	13

See Appendix B, Table 9 for more information.

Figure 24. STEM Summit 2022 Schedule

Date	Time	Session Title
April 15th	9:00 – 9:15 AM	**Welcome and Overview of the Day**
	9:15 - 10:05 AM	**Morning Keynote: STEM and Social Justice for Good**
	10:05 – 10:20 AM	Morning Break
	10:20 – 11:20 AM	Morning Breakout Sessions A. **Virtual Tour of the National Magnet Lab** B. **CFSA STEM Faculty Panel: First-generation College Graduates** C. **Enjoyment and Entrepreneurship** D. **Campus Engagement and Career Readiness**
	11:20 – 11:30 AM	**Morning Recap and How to Benefit from the Lunch and Learn**
	11:30 AM– 12:30 PM	**Lunch and Learn: LSAMP Video Showcase**
	12:30– 12:40 PM	**Amplified Voices: Learning through the Experience of Others**
	12:40– 1:30 PM	**Afternoon Feature Presentation: Student Panel on Benefits of Engaging in STEM Professional Experiences**
	1:30 – 1:45 PM	Afternoon Break
	1:45 – 2:45 PM	Afternoon Breakout Sessions A. **Undergraduate Research: What's in it for me?** B. **What is a Community Internship for Social Justice through STEM?** C. **Peer Coaching: Supporting the Progress of STEM Peers and Building a Stronger Portfolio** D. **The National MagLab: A Journey through Science**
	2:45 – 2:50 PM	Transition to Closing
	2:50 – 3:00 PM	**Closing of Summit** Link to take post-survey: https://bit.ly/Summit22_postsurvey

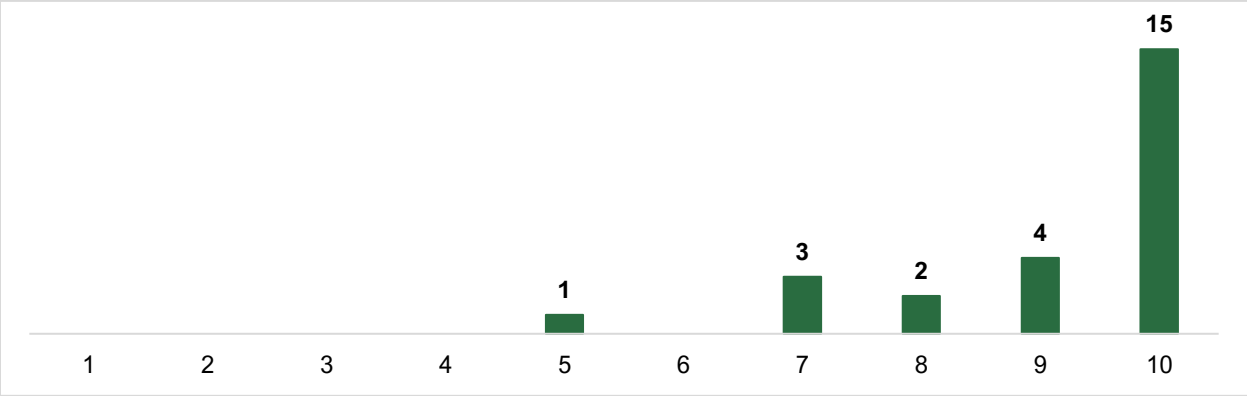
Project staff tracked the number of attendees at each component of the conference (Table 3).

Table 3. STEM Summit Attendees, by Session

Session	Attendees
Opening	40
Keynote Address	54
Morning Breakout Sessions	51
1A – Virtual Tour of the National Magnet Lab	8
1B- CFSA STEM Faculty Panel: First-generation College Graduates	19
1C- Enjoyment and Entrepreneurship	13
1D- Campus Engagement and Career Readiness	11
Student Panel	46
Afternoon Breakout Sessions	30
2A- Undergraduate Research: What's in it for me?	8
2B- What is a Community Internship for Social Justice through STEM?	6
2C- Peer Coaching: Supporting the Progress of STEM Peers and Building a Stronger Portfolio	15
2D- The National MagLab: A Journey Through Science	11

Twenty-five of the 53 student attendees completed the General Event Student Feedback Form. When asked to rate how likely they would be to recommend the STEM Summit to another LSAMP member (on a scale of 1-10 with 10 being the most favorable), a high 96% percent (*n*=24) rated the experience a 7 or above (Figure 25).

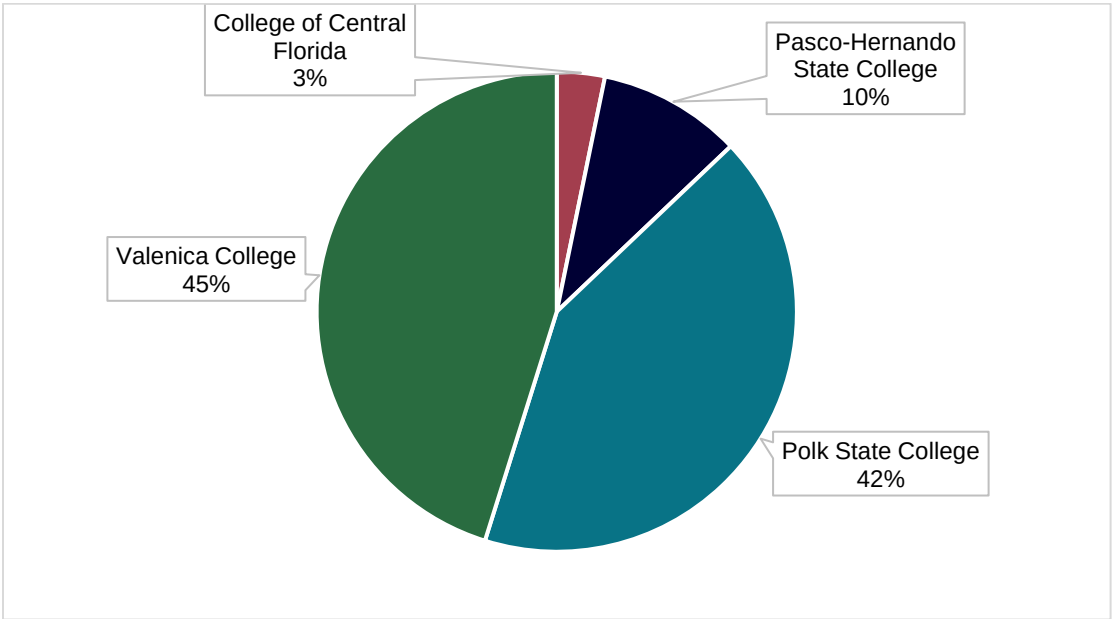
Figure 25. On a scale of 1-10, how likely is it that you would recommend this event to another LSAMP member? (*n*=25)



Summer STEM Institute 2022

In Summer 2022, the alliance also held a Summer STEM Institute (SSI). The College of Central Florida, Pasco-Hernando State College, and Valencia College collaborated to offer the SSI on the Valencia College campus. Polk State College offered its own in-person SSI for their students. In total, 31 students across the alliance participated in Summer STEM Institute (Figure 26).

Figure 26. Summer STEM Institute 2022 Participants by Institution (*n*=31)



While activities varied somewhat between the two Summer STEM Institutes, common components included presentations on the UN Sustainable Development Goals (UN SDG), hands-on STEM activities, presentations by STEM professionals, and workshops facilitated by faculty, staff, and STEM professionals focused on institutional resources. Students worked collaboratively on teams to design projects that addressed the UN-SDGs goals and presented their projects at the end of the SSI. An example student poster is presented in Figure 29.[12]

Figure 27. Students at Pasco-Hernando State College launching a rocket as part of one of the hands-on STEM activities during the 2022 Summer STEM Institute.

Students at College of Central Florida, PHSC and Valencia College also participated in a culminating field trip to the Audubon Birds of Prey Center in Maitland, FL (Figure 28). Participating students at Polk State College visited the Mote Marine Laboratory and Aquarium in Sarasota, FL.

Figure 28. Students at the Audubon Birds of Prey Center as part of SSI 2022.

[12] View student posters at: https://cfstemalliance.wordpress.com/2022/07/29/summer-stem-institute-2022-comes-to-completion/

Student Focused Fidelity 1.1

Indicator: High school seniors and first-time-in-college students participate in the Summer STEM Institute.

Alliance Status: In total, 31 students attended the 2022 Summer STEM Institute..

Institution Status:

Institution	# of Students
College of Central Florida	1
Pasco-Hernando State College	3
Polk State College	13
Valencia College	14

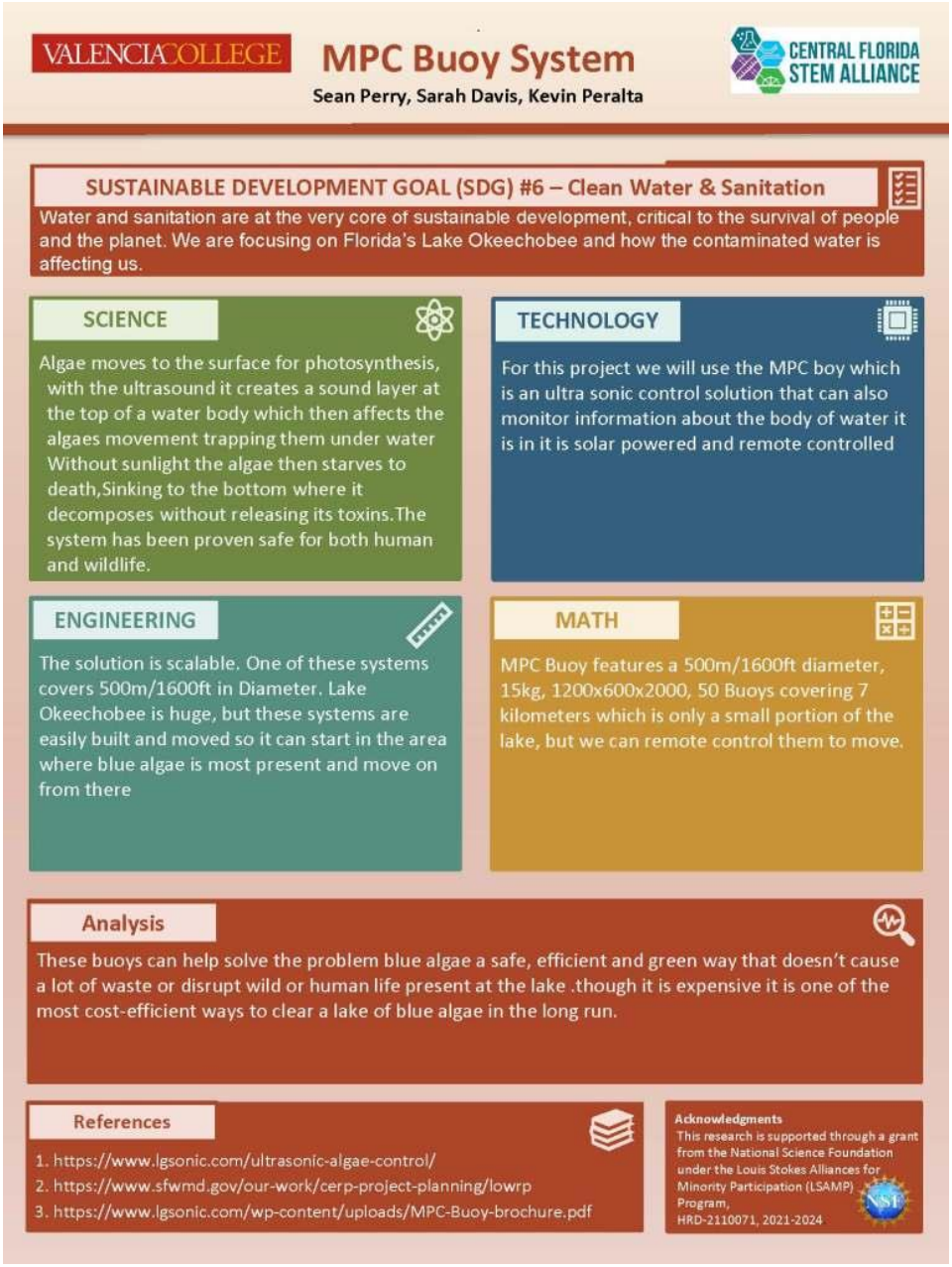
Student Focused Fidelity 2.2

Indicator: Students meet with dedicated STEM advisor to discuss appropriate math course placement.

Alliance Status: All alliance institutions have a process for advising students on math course placement.

See Appendix B, Tables 1-2 for more information.

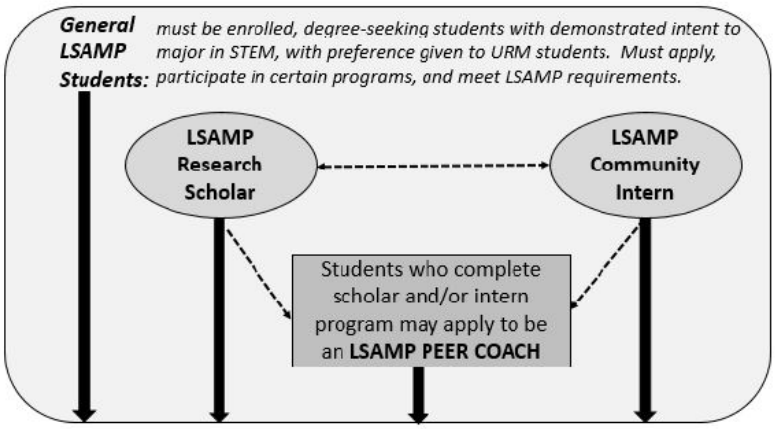
Figure 29. Student UN Sustainable Development Goal Poster, SSI 2022



STEM Professionalization Opportunities

In Spring 2022, the CFSA began offering STEM Professionalization Opportunities. The three opportunities featured during the academic year are described on p. 10. To be a Research Scholar or Community Intern, students must have participated in LSAMP for one semester. To be a Peer Coach, students must have already participated as a Research Scholar or Community Intern. Figure 30 from the original grant proposal demonstrates how these three opportunities are linked.

Figure 30. LSAMP Pathways through STEM Professionalization Opportunities

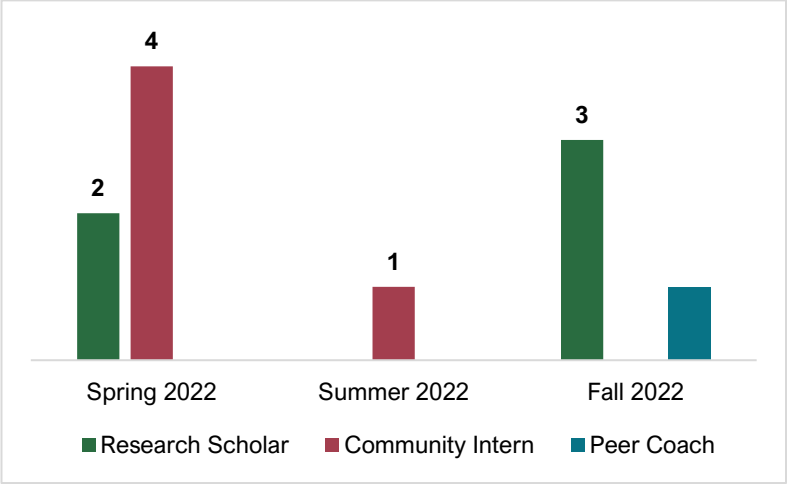


CFSA LSAMP Outcomes: Regardless of selected path, URM students are more successful in transfer to baccalaureate degree majors due to increased sense of belonging, strong STEM identity, and knowledge/skill/career development.

CFSA LSAMP Options: Alternate paths to graduation allow students to engage at varying levels. **General LSAMP Students** must complete orientation and attend workshops and will be assigned a designated LSAMP STEM advisor. Further engagement occurs when students select to be an **LSAMP Research Scholar** (via an on-campus experience or external placement) or an **LSAMP Community Intern**, with a focus on social justice, or both. The deepest level of engagement occurs when students serve as **LSAMP Peer Coaches**, providing support to other students in the program, culminating in an LSAMP showcase presentation.

Sixteen LSAMP students participated in STEM Professionalization opportunities from Spring 2022 through Fall 2022. Students primarily participated at Research Scholars or Community Interns, with one student participating a Peer Coach in Year 2 (Figure 31).

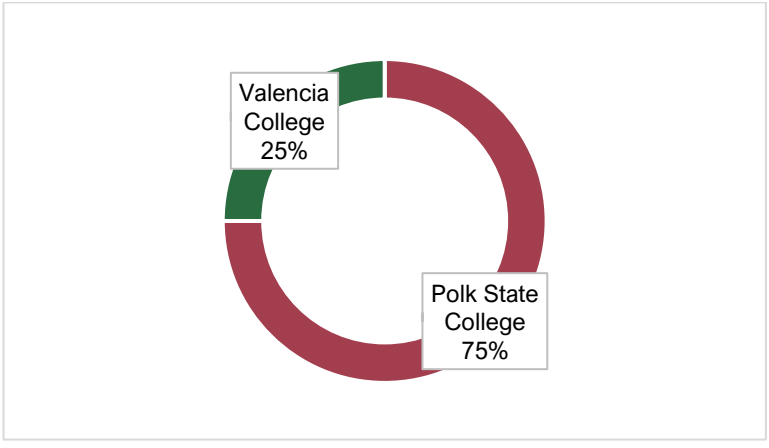
Figure 31. Number of Students Engaged in STEM Professionalization, by Term



While not included in the graph above, five students at Polk State College worked in research labs in Spring 2022.

All students who participated in STEM Professionalization to date are from Valencia College or Polk State College. Both institutions have had Research Scholars and Community Interns, while Polk State has also had one Peer Coach. (Figure 32).

Figure 32. Students Participating in STEM Professionalization by Institution



Student Focused Fidelity 12.3

Indicator: Peer Coaches engage in a minimum of 40 hours of peer support.

Alliance Status: In Year 2 (Spring 2022 through Fall 2022), 100% of Peer Coaches (*n*=1) completed the minimum hour requirement.

Institution Status:

Institution	# of students completing the requirement
Polk State College	1

See Appendix B, Table 13 for more information.

Of the participating students, 94% (*n*=15) completed the minimum-hour requirement (one Research Scholar completed 38.7 hours of the requirement). Eighty-one percent of students (*n*=13) participating in a STEM Professionalization opportunity completed the presentation requirement at the time of this report. The three who did not were Research Scholars in Fall 2022 and may present at a LSAMP Student Showcase later in AY2022-2023.

During the time period of this report (Spring 2022 through Fall 2022), students at Pasco-Hernando State College were ineligible to participate in STEM Professionalization activities as they did not join until Fall 2022. The College of Central Florida did have members in Fall 2021 and Spring 2022 who hypothetically were eligible, but the alliance-wide challenge of recruiting students to LSAMP early in their two-year academic trajectory has made it less likely that students have enough time to participate in STEM Professionalization experiences.

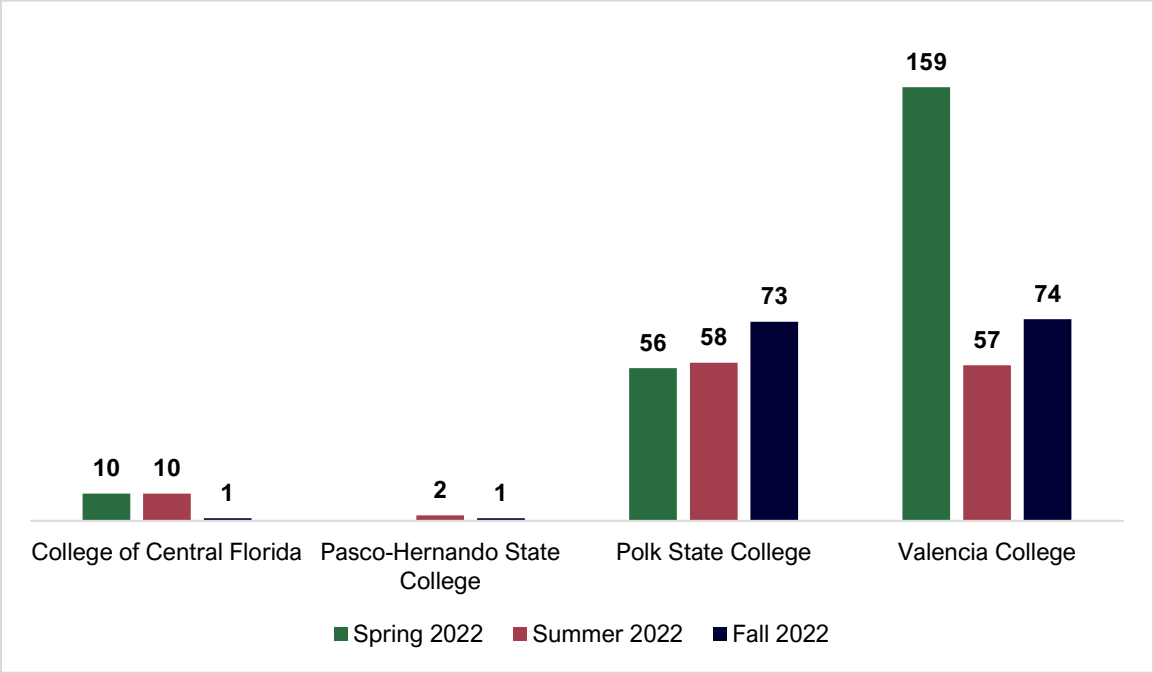
This challenge is also impacting recruitment of Peer Coaches in Year 2. Fall 2022 was the only term in which students were eligible to Peer Coach, with only seven students across the alliance having been Community Interns or Research Scholars in Spring 2022. Recruiting students early enough in their first year at each institution will be vital to ensure a robust offering of Peer Coaching in the future.

Overall, the CFSA LSAMP Alliance successfully implemented all student focused activities and made significant progress in recruiting between Spring 2022 and Fall 2022. Engaging LSAMP scholars in at least three activities per term remains challenging. However, the number of engagement opportunities increased from 45 in Fall 2021 to 209 throughout the time period of this report, Spring 2022 through Fall 2022. The virtual STEM Summit in Spring 2022, with 85 total attendees (of which 53 were students), and the 2022 Summer STEM Institute, with 31 participants across the alliance, offered dynamic opportunity for engagement. With the implementation of STEM Professionalization opportunities, sixteen students participated as Research Scholars, Community Interns, or Peer Coaches between Spring 2022 and Fall 2022. A detailed breakdown of student-focused fidelity indicators can be found in Appendix B.

Faculty Focused Fidelity

Between Spring 2022 and Fall 2022, CFSA LSAMP alliance engaged 501 (potentially duplicated) faculty/staff members in student activities across the alliance (Figure 33).

Figure 33. Number of Faculty/Staff Attendees by Term



Faculty/staff participated in the virtual April 2022 STEM Summit (*n*=12) and in the Summer STEM Institutes (*n*=26, potentially duplicated).

The CFSA met quarterly between Spring 2022 and Fall 2022 (March, September and February 2023). A meeting scheduled for December 2022 had to be cancelled due to conflicting schedules. To avert this in the future, project staff compared calendars and set a yearly schedule for CFSA meetings that will not conflict with institutional calendars going forward. The Quarterly Alliance Meetings have been productive and well attended. Each meeting agenda varies slightly but all meetings include institution updates, updates from the Alliance Director and time for work groups to collaborate. The evaluator has also presented end-of-year and mid-year briefings at these meetings.

While CFSA work groups continue to confer at Quarterly Alliance Meetings and some work groups met in November/December 2022, their progress has been limited. This can be attributed to work group assignments being made initially in Fall 2021 before the partner institutions had fully filled their LSAMP-related positions or identified faculty willing to participate. Consequently, individuals were assigned to several different work groups, making it difficult for them to be present at all of the assigned group meetings. With the revision of the work groups in December 2022 and the new work groups announced at the February 2023 Quarterly Alliance Meeting, the new groups are now more effectively comprised and planning to meet prior to the next quarterly meeting.

Implementation teams at each institution vary in size and scope. At the smaller institutions, implementation meetings may be just two individuals. However, all institutions are meeting regularly with these teams.

The one faculty-focused fidelity action not yet implemented during the time period of this report (Spring 2022 through Fall 2022) is the offering of faculty workshops. However, two faculty workshops were planned for April 2023. The topics of both workshops are undergraduate research—one will be offered virtually and the other in person as part of the 2023 STEM Summit. Attendance data will be presented in the next evaluation report.

The regular participation of stakeholders in student activities, the newly formed work groups, and plans for faculty workshops shows steady progress on the grant goals and set the alliance up for success. A full breakdown of faculty-focused fidelity indicators can be found in Appendix B.

Department/Institution-Focused Fidelity

Spring 2022 saw the formation of the Governing Board, comprised of the president from each institution. The Governing Board's initial meeting in January 2022 was followed by meetings in May and November of 2022, with their next meeting scheduled for May 2023.

The assessment and evaluation work group collaborated via email in Fall 2021. The restructuring of work group assignments revitalized this work group's meeting in December 2022.

The Alliance Director explained that other activities in this category such as developing articulation agreements, STEM degree pathways, and data sharing agreements with university partners could not be initiated yet as they rely on work group support. It is anticipated that substantive progress will be achieved in this domain now that the work groups have been reconfigured. A full breakdown of department and institution-focused fidelity indicators can be found in Appendix B.

Sustainability

Several actions and efforts in the second year of implementation support sustainability:

- **Establishing regular communications:** Meetings and procedures established last year by each institutional partner and alliance-wide continue. The co-principal investigators, Project Director, Valencia's Director of Grant Compliance, and the external evaluator regularly participate in monthly meetings that facilitate communication, collaboration, and allow these key stakeholders to work through challenges. The Alliance Director affirmed that the meetings have helped increase ownership of the program at each institution. The regularity of alliance quarterly meetings and governing board meetings also support sustainability.

  The cancellation of the December quarterly meeting due to conflicting institution calendars spurred the LSAMP teams to work proactively on setting up a meeting schedule in advance for the upcoming calendar year. Taking this kind of action will increase participation and lessen conflict. The CFSA will continue this practice each year.

- **Fine tuning project components:** To ensure students could complete requirements, including orientation, LSAMP teams at some of the partners instituted recruitment cutoff dates. They have been sharing Research Scholar opportunities, which helps address the challenge of finding appropriate Research Experiences for Undergraduates (REUs).[13] LSAMP teams have also collaborated to offer a series of workshops that help to prepare students across the alliance for the application process. Adapting components in response to student need or limitations ultimately makes them more sustainable.

- **Undergraduate Research:** LSAMP teams are in continuing conversation about how to expand undergraduate research opportunities to more students despite the barriers at the respective institution. During the evaluator's annual site visit, LSAMP teams that had successfully initiated undergraduate research programming affirmed a commitment to this aspect of the project beyond the grant term. LSAMP teams that are just getting started on this component express confidence that their efforts in this regard would also endure beyond grant funding.

Stakeholder Recommendations

During separate focus groups and site visits, students and faculty offered recommendations they felt might improve the LSAMP program.

Students were generally satisfied with LSAMP. Their recommendations focused on providing a greater variety and number of engagement and professionalization opportunities. Students affirmed the benefits of attending conferences and college visits and suggested offering more of these kinds of activities. They would also like more workshops and to have opportunities in more STEM fields (e.g., medicine, biomedical engineering).

Faculty recommendations addressed recruitment challenges (e.g., going to high schools to recruit, making recruitment videos with current LSAMP students). They also requested more clarity on the role and deliverables of work groups. Due to the overlapping way stakeholders were assigned to work groups in Fall 2022, stakeholders had to choose between group meetings, which impacted the number of attendees and the progress that could be made during meetings. Although members discussed tasks, they were unable to make significant progress on them between Spring 2022 and Fall 2022. Faculty would like the LSAMP leadership team to clarify expectations for each work groups so members have a road map and can be more productive when they meet.

[13] https://beta.nsf.gov/funding/opportunities/research-experiences-undergraduates-reu

Chapter Three: Institution Implementation Findings

College of Central Florida

Current Status

The College of Central Florida, which is comprised of five campuses, was the third institution to join the LSAMP Alliance right before the pandemic. As such, its progress is limited in comparison to the other partners. Between Spring 2022 and Fall 2022, the time period of this report, the college implemented all project components except for STEM professionalization experiences; plans for this activity were in place as of February 2023.

The College of Central Florida had seven LSAMP members in Fall 2022. Project staff aim to recruit more students earlier in their two-year academic stay to address the challenge, noted alliance wide, of students not being able to fully participate in LSAMP activities when recruited in their second year on campus. It has also been challenging that students in the College of Central Florida's highly-ranked[14] nursing program and other biomedical programs are not eligible for LSAMP funding, according to NSF.

From Fall 2021 to Fall 2022, the overall number of LSAMP participants did not change substantially at the College of Central Florida. Although the LSAMP cohort was the smallest of the alliance partners, the team successfully engaged these students in orientation and advising. The percentage of students completing orientation varied by term (75%-100%), with 100% of new LSAMP members (*n*=6) completing orientation in Fall 2022. Each term 100% of students met with their advisor at least once.

Ensuring participation in at least three activities per term was more challenging. Only 38% of students (*n*=3) met this requirement in Spring 2022 and none did so in Fall 2022. It is unclear if all such opportunities are as regularly tracked and counted as at the other institutions (e.g., STEM Club meetings), which may be skewing this data.

Between Spring 2022 and Fall 2022, the College of Central Florida took LSAMP students on tours of the University of Central Florida and Florida A & M University. They visited labs on both campuses. They also attended conferences, including the Community College Innovation Challenge in Summer 2022.

Institution Successes

During Year 2 (Spring 2022 to Fall 2022), the LSAMP project director of the College of Central Florida, who is also the advisor for Phi Theta Kappa International College Honor Society, partnered the LSAMP program with the honor society to bring the Voyage Project to campus. This endeavor will place a 1 to 10-billion scale model of the solar system on the college's Ocala

[14] RegisteredNursing.com ranks the College of Central Florida's Citrus Campus Nursing Program as the top in the state (https://www.registerednursing.org/state/florida/#rankings).

campus.[15] LSAMP staff also partnered with faculty working at the college-owned Vintage Farm to develop research opportunities to students.

The College of Central Florida's STEM Club, which organizes a variety of activities throughout the academic year, serves students at both the Ocala and Citrus campuses. Club meetings continue in virtual format to allow students who have classes on both campuses to attend. Students network with like-minded peers and learn about the LSAMP program at meetings. During the evaluator's site visit, club members were working on projects related to their applications for the Community College Innovation Challenge.

In the student focus group, they expressed enthusiasm for LSAMP activities that introduced them to STEM pathways and facilitated networking opportunities. They liked learning about different STEM careers through LSAMP-supported college and industry tours. Students who attended LSAMP-supported conferences and the Community College Innovation Challenge affirmed the benefits of networking: "*Just being able to connect with others that we wouldn't necessarily be able to in our own institutions is really nice."* Participating in these opportunities can be transformative, according to this student: "*I've pretty much changed my entire path. I know I'm going to graduate now. I've seen how people do research, I've seen the research people do. I'm super interested in certain institutions*." These activities are pivotal to expanding the realm of possibilities students imagine for themselves beyond the two-year college pathway.

Institution Challenges

During Year 2 (Spring 2022 through Fall 2022), the LSAMP program at the College of Central Florida experienced a significant challenge with recruitment, and to a lesser extent engaging students in activities and providing STEM professionalization.

As noted earlier, the number of LSAMP members at this college remained largely the same between Fall 2021 and Fall 2022 due to the difficulty of bringing LSAMP students into the program early enough in their first year. LSAMP staff have yet to build a bridge with the first-year advisors to ensure robust promotion of the LSAMP program with incoming students. Project staff plan to mitigate this challenge through improved coordination with first-year advisors and the STEM advisor. They are also assessing the feasibility of organizing visits to local high schools to recruit. The team is also looking at connecting with potential LSAMP students during the Lockheed Martin's STEM Industry Tour, which will take place at one of the College of Central Florida's campuses in 2023.

As discussed elsewhere in this report, engaging students with STEM professionalization experiences has been challenging. Secondly, student research opportunities at this small campus are limited, which impacts implementation of the grant's Research Scholar component.

Students offered insight into a tangentially related challenge. Ultimately, low recruitment results in fewer students involved, which makes LSAMP and STEM Club rely on the same students for

[15] http://voyagesolarsystem.org/

everything. Students were disappointed that more of their peers were not stepping up. One student reported on the lack of enthusiasm for leading student activities:

> *We'll ask people like if they have any ideas of what they want to do for this semester. If they want to do anything on campus. Nobody ever says anything. So, nothing ever happens because nobody wants to force people to do something they don't want to do.*

Evidence of Sustainable Efforts

The College of Central Florida's LSAMP staff is comprised of the Co-principal investigator, two faculty STEM Club advisors, and a STEM academic advisor. Although it took time to hire the STEM academic advisor in Year 1, they are now ready to focus on robust implementation of LSAMP at the college. The STEM academic advisor is funded by the college as the STEM major advisor will remain in place regardless of LSAMP funding.

While overall engagement in LSAMP has been low, opportunities for student engagement are expected to continue regardless of funding. In Summer 2022, the College of Central Florida was one of the two CFSA institutions to participate in the Community College Innovation Challenge. After experiencing success with this program, student interest in participating increased. Several student teams at the college are currently applying and the college made alternate opportunities for international students who were ineligible.[16] LSAMP project staff are committed to continuing their involvement in the Community College Innovation Challenge beyond the grant term.

Finally, project staff partnered with faculty working at the college's Vintage Farm to design a student research opportunity; it is now welcoming its first student participants. The College of Central Florida is committed to continuing this opportunity, which is the first formalized undergraduate research opportunity to be offered at the college.

[16] For the Community College Innovation Challenge, student and faculty/administrator mentor team members must be U.S. citizens, nationals, or permanent residents.

Pasco-Hernando State College

Current Status

Pasco-Hernando State College (PHSC) is the newest institution to the alliance and began working with LSAMP in Fall 2021. The PHSC LSAMP team initially focused on filling open positions, planning for recruitment, and ensuring infrastructure was in place for a successful first semester of student participation. An LSAMP advisor began working in April 2022. The institution's existing STEM Club had been "*decimated"* according to project staff and had no existing LSAMP members in Year 1.

In Summer 2022, the team recruited three LSAMP scholars from the Summer STEM Institute and increased the LSAMP cohort to nine by Fall 2022. At the time of the evaluator's annual site visit in Spring 2022, enrollment had continued to increase. Of the students recruited in Fall 2022, 67% (*n*=6) were URM students.

In Year 2 (Spring 2022 to Fall 2022), project staff successfully implemented all program components with the exception of STEM professionalization opportunities (no students were eligible in from Spring 2022 to Fall 2022). PHSC has effectively engaged students in completing orientation (89%-100%) and meeting with their advisor at least once per term (67%- 76%). Getting students to participate in at least three LSAMP activities has been more challenging, with no students meeting this requirement in Fall 2022 (inconsistency in tracking and counting engagements may be skewing this data).

Institution Successes

In Spring 2022, the LSAMP team invited Pasco-Hernando State College students majoring in STEM to attend the virtual STEM Summit. PHSC math faculty offered this opportunity as extra credit for their students. The LSAMP team also sent targeted email to students at the beginning of the year and worked with advisors to ensure LSAMP is widely promoted through them to eligible students.

The STEM advisor works with the college's academic advisors to plan the best possible course pathway for students. The LSAMP STEM advisor reviews individual academic plans with students to confirm the courses they are taking are sufficient to transfer.

Math faculty involved with LSAMP provide informal advising to students. One faculty member noted no one is better suited "*to advise students about the math sequences than the math professors.*" Having an LSAMP advisor and advising support from math faculty has helped LSAMP students meet the math requirements they need to transfer to four-year institutions.

In Year 2, LSAMP staff have made productive connections with other programs. For example, the LSAMP advisor is also the pre-collegiate program advisor, which enabled LSAMP to form a partnership with the College Reach Out Program (CROP).[17]

PHSC LSAMP students reported a strong sense of community and high level of academic support from project staff: "*We're given a lot more opportunities, a lot more chances to put ourselves further than where we probably would have gotten just by ourselves*."

Institution Challenges

While PHSC LSAMP staff successfully recruited nine students by Fall 2022, recruitment remains a challenge for this institution. LSAMP staff note that building and maintaining a network of feeder high schools would enable them to recruit students in their first semester at PHSC, thereby giving them a full two years of beneficial impacts from participating in LSAMP.

Due to the small size of Pasco-Hernando State College, project staff have found it harder to coordinate college tours at large four-year institutions because they often prioritize large student groups when scheduling campus tours. Collaborating with alliance partner institutions to bring a combined group of students is one way to address this issue.

Finally, PHSC, like other institutions in the alliance, has limited opportunities for student research experiences. LSAMP project staff have reached out to other local institutions to explore the potential to collaborate on student research experiences.

Evidence of Sustainable Efforts

During Year 2 (Spring 2022 to Fall 2022), the LSAMP team leveraged pre-existing programs at Pasco-Hernando State College to support student recruitment and engagement. Partnering with long-standing programs such as CROP and the Center of Excellence[18] creates new avenues for recruiting LSAMP students. As part of CROP, for example, students are admitted to participating post-secondary institutions after completing the program and meeting certain requirements.

The LSAMP team at PHSC is also building relationships with local colleges and other LSAMP alliances. The Co-PI is in conversation with a local college about reserving REU spots for LSAMP students on their campus and initiated a conversation with the Tampa Bay Bridge to Baccalaureate alliance.

[17] https://equity-services.phsc.edu/students/pre-collegiate/college-reach-out-program

[18] https://equity-services.phsc.edu/students/pre-collegiate

Polk State College

Current Status

Polk State College is comprised of two campuses and has the second oldest affiliation with the alliance. A college advisor serves as both the STEM Club advisor and the LSAMP academic advisor. This advisor remained in position from the conclusion of the last grant to the new grant; this continuity contributed to LSAMP's success at this college. At the end of Fall 2022, Polk State College had recruited 93 LSAMP members (an increase of 41 over the prior year). Of these, 70% belonged to racially and ethnically minoritized groups.

The percentage of students completing orientation varied by term (83%-100%), with 100% of students (*n*=93) completing orientation in Fall 2022. The percentage of students meeting with their advisor at least once also varied.[19] Ensuring students participate in at least three activities has proved to be more challenging, with only 30%-41% of students meeting this requirement each term.

Between Spring 2022 and Fall 2022, Polk State College took students on tours of the Institute for Human & Machine Cognition, the Mote Marine Laboratory and Aquarium, and to Florida A & M University. Students attended conferences and participated in the Community College Innovation Challenge in Summer 2022. Notably, Polk State College was the only alliance institution to offer all three types of STEM Professionalization experiences (i.e., Research Scholars, Community Interns, and Peer Coaches) between Spring 2022 and Fall 2022.

Institution Successes

The LSAMP team at Polk State College was successful with recruitment since Fall 2021 and managed to increase the number of LSAMP members in Fall 2022 to 93 students. This success is attributable to sharing LSAMP information with high school counselors and institutional advising staff to ensure they know about LSAMP, and collaborating with other campus programs such as TRiO. "Word of mouth" between students, faculty, and staff was also a contributing factor.

Students and faculty reported a strong sense of community among Polk State College LSAMP participants supported by STEM Club and peer mentoring. Faculty mentors have been instrumental in making students feel welcomed in LSAMP. Many students reported forming deep, meaningful connections by participating in LSAMP activities together. One student shared how participation in a conference engendered a sense of community and solidarity amongst the like-minded STEM students of different backgrounds :

> *We were able to meet new people from the other side of the world. We even had similar ideals and similar ideas [about] how we looked at some situations like world hunger and how to address them. It was very beneficial because it showed that even though we're in*

[19] Advising data were not available for Fall 2022 at the time of this report.

> *different regions, we're basically the same because we have the same opinions, the same ideas.*

The LSAMP advisor encourages students to help each other with coursework, which has been instrumental to building a sense of community in this cohort. While not captured in project documentation, students reported engaging in informal tutoring and study sessions. While the evaluator observed a STEM Club meeting, the LSAMP advisor worked with club members to identify those who could support their peers who were having difficulty in STEM classes. This student confirmed the positive impacts of the advisor's effort on participating students:

> *He made sure students become like a pillar to each other. So if I have taken this course and I have notes from this course, here's my notes. It's like a community, a family. You'll see the shy students come in; they do not talk and they're timid. But then they join and [other students share], "Oh, let me tell you what I learned today" [or] "Let me tell you about this project, this research. I have a mentor." Now they're so excited about the LSAMP program.*

During Spring 2022, five LSAMP students participated in STEM-related work study opportunities. Students reported that LSAMP provides opportunities to develop important job skills and experiences that make them more desirable candidates when they enter the job market. The LSAMP advisor is proactive in preparing students to attend conferences and other professional opportunities, even carrying extra neckties on conference trips for student use.

Students affirmed that participating in LSAMP increased their sense of STEM identity. Faculty and staff involved in the program noted increased student confidence since joining LSAMP, which students also confirmed: "*I feel LSAMP has given me opportunities to stand out in front of a crowd being able to say my piece.*" In a focus group with the evaluator, students spoke encouragingly about seeing increased confidence in each other.

This increased confidence and strong sense of community among participants make it more likely students stay involved in the LSAMP program throughout their two-year academic stay. LSAMP graduates have come back to campus to participate in LSAMP events and presentations.

Institution Challenges

While recruitment into LSAMP at Polk State College has been successful, stakeholders aim to improve it. Both students and faculty view the STEM Club as an important contributor to LSAMP recruitment because it is open to all and well known on campus. However, student club leaders reported the need for more high-interest opportunities to attract potential new members, particularly after pandemic restrictions reduced club membership and offerings.

Budget restraints at this college have limited the number of hands-on activities and opportunities for students to attend conferences and field trips. Student leaders view these types of activities as key recruitment tools because they capture students' attention and entice them to join STEM Club and LSAMP. A student felt that having only STEM Club meetings, was *"not really going to catch their interest if they're not really doing anything that's going to benefit them*."

Evidence of Sustainable Efforts

Polk State College has a strong protocol in place to inform new staff about LSAMP, which includes a briefing event for academic advisors to give them comprehensive knowledge of the program's benefits. The LSAMP team's partnership with the TRiO program at Polk State College provides institutional support in terms of recruitment. Overall, LSAMP and STEM Club as viewed as ingrained components of Polk State College's institutional structure. Indeed, STEM Club has the highest participation and meeting frequency of any club on the campus, according to the LSAMP team. Polk State College will continue to support STEM Club; the institution has also funded faculty research mentor stipends from non-LSAMP budget lines.

Valencia College

Current Status

Valencia College, comprised of eight campuses, initiated the first LSAMP grant and continues serving as the lead of the current grant. Valencia College's LSAMP program has an Implementation Coordinator and three advisors serving its East, West, Osceola campuses. At the end of Fall 2022, Valencia College had recruited 75 members (an increase of 35 members over Year 1). Of those LSAMP members, 71% belonged to racially and ethnically minoritized groups. LSAMP students are involved in STEM Clubs at each campus, which include the Women in STEM Club on East Campus and the Osceola Young Engineering Association.

A high percentage of students completed LSAMP orientation (100% in Spring 2022; *n*=74 and in Fall 2022; *n*=22). In Summer 2022, 67% of students (*n*=31) completed orientation, but it is unclear why this level of participation was so much lower. While the percentage of students meeting with their advisor at least once per term varied (79%-100%), the majority of students completed their requirement each term. In fact, Fall 2022 saw 98% of students (*n*=39) who met with their advisor at least once. Similar to other institutions, engaging students in at least three activities was challenging; between Spring 2022 and Fall 2022 , the percentage meeting this requirement ranged from 22% to 68%.

Valencia College took LSAMP scholars on field trips to the Institute for Human & Machine Cognition and the Audubon Center for Birds of Prey, and on a college tour to Florida A & M University. Students participated in conferences, including the Florida Undergraduate Research Conference and the Annual Biomedical Research Conference for Minoritized Scientists.

Institution Successes

During the evaluator's annual site visit, students reported high satisfaction with LSAMP, pointing out that LSAMP programming enhances their overall experience of community college, as this student's comment illustrates:

> *I didn't think this school was a place of any opportunity. Honestly, I had to come and I didn't really want to come. So I'm just going to do what I need to do to get a scholarship and go there. [Then] coming here I realized, okay, this place is serious. There's so much opportunity that kids don't know about.*

Students also reported that LSAMP keeps them motivated by showing them options they can look forward to when they finish their degrees:

> *Having some projects on the side that you can do, to kind of not get discouraged and see the fun side of your major is something that I think is important, it doesn't make you lose motivation. It also prepares you for when you enter that university that you want.*

Students characterized the LSAMP activities offered at Valencia College as enjoyable and engaging. These activities helped students explore different career paths in their majors they can pursue after graduation. Students also appreciated non-STEM related LSAMP activities hosted at Valencia College, particularly the minority-related events, which they found stimulating and refreshing. One student shared their experience at an MLK parade that counted as an LSAMP activity:

> *I went to the recent MLK parade because it was focused on minority participation and I liked that. I think stepping outside of STEM once in a while and kind of showing that you know parts of minority history is important. So, I appreciate having that activity available to me and being able to participate and count it as part of the requirements.*

Faculty also reported positive regard for LSAMP program. They have seen the program's positive impact on students and shared specific student successes. Faculty consider the Research Scholars a particularly valuable opportunity for students and see the program's community-building component as a factor helping to increase student retention and decrease social isolation.

As previously noted, the LSAMP program partnership with the VECTOR program is synergistic. VECTOR Scholars are strongly encouraged to attend the Summer STEM Institute (held by LSAMP) according to the VECTOR website.[20] VECTOR Scholars are also required to have an undergraduate research experience, either by completing the Valencia Honors Research Course (IDH 2912) or joining LSAMP and completing a research project through the Research Scholar component. The similar goals of these two programs enable project staff of each program to collaborate on sharing opportunities with prospective students.

Finally, Valencia College has offered strong STEM Professionalization opportunities. Between Spring 2022 and Fall 2022, students participated as Research Scholars and Community Interns. One staff member who acknowledged the importance of LSAMP Research Scholar opportunities explained why some students did not pursue research with other programs:

> *Some students don't want to do the Honors [research]. They would rather be part of a different kind of community that reaches them. Honors is an important program, but it's a big, widespread program; it can be hard for some students (trying to put myself in their shoes), probably hard to feel that connection in some ways.*

Institution Challenges

Challenges between Spring 2022 and Fall 2022 for the LSAMP program at Valencia College were minimal compared to their successes. Although many students have returned to campus after the pandemic, some students still attend virtually. Project staff reported that engaging and building a sense of community with this mix of in-person and online students has been challenging: They observed a "*disconnect in off campus or online students. We try to cater to them but sometimes it's not the easiest thing to do*."

[20] https://valenciacollege.edu/finaid/programs/scholarships/vector/about-vector.php

Student leaders reported issues with students committing to an activity or presentation and then not showing up:

> *I think when you talk to people on campus, they're willing to [participate], but when the time actually comes, they don't actually show up. So, consistency is the issue in terms of student participation.*

Tangential to this issue is that although these students qualified for STEM Professionalization experiences and wanted to participate in these opportunities, they were not able to put in the required 40 hours. Project staff expressed frustration at not being able to better accommodate this group of students.

Evidence of Sustainable Efforts

While Valencia College already had undergraduate research opportunities, this aspect has been strengthened by implementation of the LSAMP Research Scholars component. VECTOR is another avenue of opportunity for LSAMP students. Students value the Research Scholar experience for the early exposure to hands-on research it provides. Project staff believe these opportunities are very important because they target a different group of students than the Honors research course.

In Fall 2021, LSAMP advisors were rehoused under a new department in the Partnerships for Educational Equity office, which was also home to the Co-principal investigator. Project staff affirmed this change has been beneficial. When the advisors were housed in Student Services, they were often asked to take on other roles. In the new structure, advisors have been able to maintain a targeted focus on serving LSAMP students.

Chapter Four: Alliance Outcomes

The outcome evaluation utilizes both quantitative and qualitative data to identify student, faculty, and institutional impacts from the CFSA project. Three guiding evaluation questions are used to assess CFSA project outcomes:

1. To what extent were the intended outcomes realized at the Alliance and individual campus levels?

2. What was the relationship of fidelity of implementation to mid- and long-term student outcomes including graduation rates, sense of belonging, application and transfer rates, and STEM self-efficacy and identity (including after transfer)?

3. Were there any unintended outcomes associated with the CFSA project?

These questions are addressed by each of the 10 strategic indicators in the following sections.

The outcome evaluation also includes an outcome study that will be conducted in the final year of the project utilizing a quasi-experimental design (QED) to establish a cause-and-effect relationship between engagement with the LSAMP program and these indicators:

- SI.2 Increase in LSAMP URMs who maintain a GPA of 2.75 or higher;

- SI.3 Increased retention and persistence rates compared to prior grant years and non-LSAMP URM STEM students;

- SI.6 Increase in LSAMP URM student graduation rates;

- SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in four-year baccalaureate programs.

Method for Analyzing LSAMP Participation Data for Outcome Evaluation

To determine the cause-and-effect relationship between engagement with the LSAMP program and several of the strategic indicators, groups must be formed. The study design is a non-equivalent groups design in which groups are not similar because they have not been randomly assigned but rather determined based on levels of participation in LSAMP. While participation groups were conceptualized during the evaluation plan development, it was necessary to determine if these would work prior to conducting the outcome analysis in the final year of the grant.

The evaluator intended to determine groups based on engagement with the LSAMP program.[21] However, this design proved challenging as students enter LSAMP at different times and

[21] The original plan was to create three groups based on levels of engagement: 1) **Low Engagement**: Students who complete the minimum requirements to remain in LSAMP; specifically participation in three LSAMP experiences per semester, and meeting with STEM advisor one time per semester; 2) **Medium Engagement**: Students who demonstrate additional engagement in LSAMP, specifically participation in four to seven LSAMP activities per semester (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or being a Research Scholar, Community Intern or Peer Coach, and meeting with STEM advisor one or more times per semester; and 3) **High Engagement**: Students who demonstrate significant engagement in LSAMP, specifically participation in eight or more LSAMP activities per semester (e.g., STEM tours, college tours, STEM conferences, and

participation varies by semester. The evaluator engaged in an exploratory analysis with some initial strategic indicator data, matching it with implementation data to determine how groups could be formed effectively. It was determined that a "participation score" would need to be calculated to allow the evaluator to control for variation in participation across semester and time as an LSAMP student.

To calculate this participation score, activities and advising meetings were summed across every semester the student was an LSAMP participant. These data came from the Student Activity Logs submitted by project staff each semester. For example, if a student participated in one activity in Fall 2022 and two activities in Spring 2023, they would receive a score of 3 for activities and meetings.

While activities varied for shorter time commitments such as STEM Club meetings and workshops to longer time commitments such as field trips, the evaluator recognized that participation in STEM Professionalization experiences, which took a minimum of 25-40 hours, should be treated differently. Therefore, if a student engaged in a STEM Professionalization experience, they received an additional score of 4, which was equal to the expected amount of engagement in one semester (i.e., one advising meeting and three activities).

The total score was summed across activities, advising meetings, and professional activities to create an actual score. In the examples provided in Table 3 below, the student participated in several advising meetings and activities each semester except in Summer 2022 when they only participated in one activity. Each of these meetings and activities counts as one point in the participation column. The student also was a Research Scholar in Fall 2022, so they received four points in the STEM Professionalization column. This gave the student a total score of 17.

Table 4. Example Scoring

Student ID	Participation Fall 2021	Participation Spring 2022	Participation Summer 2022	Participation Fall 2022	STEM Professionalization	Total Score
11111	2	5	1	6	4	18

The total score was helpful but did not account for the length of time a student was involved in LSAMP. If the total score was used, students who had been in LSAMP longer would be marked as having a high level of participation. Therefore, the actual score was then divided by a projected score. The projected score is based off of the semester the student started and the amount of activities and meetings the student was projected to engage in over the course of the semester(s). Because students are expected to participate in one advising meeting and three activities per semester, this equated to four multiplied by the number of semesters the student had participated. In the example above, the student was involved in four semesters. Therefore, the student's projected score was 16. The actual score is divided by the projected score (i.e., 18/16= 1.13) to determine a standardized score for each student. This was then used for analysis.

peer and student-led activities) or being a Research Scholar, Community Intern or Peer Coach, and meeting with STEM advisor one or more times per semester.

An analysis to determine the range for each level of participation was conducted using AY 2021-2022 data for 273 LSAMP members. Of those 273 students (Figure 34), 14 students (5.1%) were categorized as having high levels of participation in LSAMP, 46 students (16.8%) had "on track" participation in LSAMP, and 213 students (78.0%) had low levels of participation in LSAMP. Notably, because few students participated in STEM professionalization activities in AY 2021-2022, the number of students categorized as being at the high level of participation is expected to be low.

Figure 34. Participation in LSAMP across LSAMP Members (*n*=273)

In terms of LSAMP URM students, the data was similar to that of the whole group of LSAMP members. In total, nine (9.18%) were categorized as having high levels of participation in LSAMP, 26 (26.53%) had "on track" participation in LSAMP, and 63 (64.29%) had low levels of LSAMP participation.

Strategic Indicators

Strategic indicator data is provided below and in Table 5. Strategic indicator data for AY2021-2022 were available from three of the four institutions at the time of this report, with exception of Strategic Indicator # 4.[22] Unlike the other strategic indicators, SI.4 uses implementation data which was provided by each institution throughout the grant. However, some of the strategic indicator data were incomplete (e.g., missing STEM major information). The next evaluation report will present complete strategic indicator data from all four institutions.

In addition to the outcome evaluation questions, fidelity question #3 is presented in this section:

- What was the relationship of fidelity of implementation to short-term outcomes associated with student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate?

[22] Strategic indicator data was provided by all institutions except the College of Central Florida. Strategic Indicator data were requested from all institutions at the end of each term (1/12/22, 5/25/22, 11/4/22, 1/12/23). Follow up emails were sent on the due dates of the requests and after the requests. In addition, reminders were shared during monthly conversations.

Table 5 presents an overview of baseline and current year data (when available). Detailed information about each strategic indicator follows this table.

Table 5. Strategic Indicator Overview

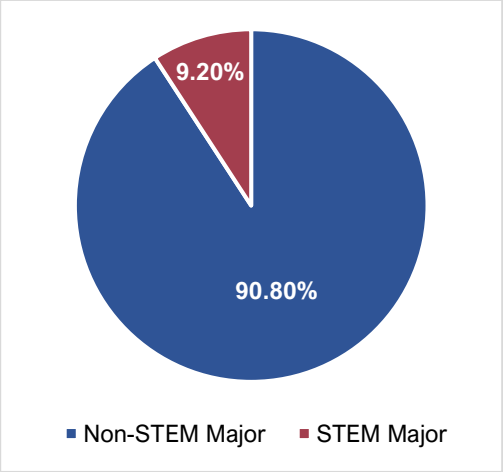
Strategic Indicator	Baseline[23]	Current Year
SI.1 Increase in LSAMP URMs declaring STEM major	18.8% (Fall 2021)	N/A
SI.2 Increase in LSAMP URM students maintain GPA of 2.75 or higher	80.2% (Fall 2021)	68.8%
SI.3 Increased retention & persistence rates compared to prior grant years & non LSAMP URM STEM students	Retained: 100% (Fall 2021) Persisted: 58.3% (Fall 2021)	Retained: 50.7% Persisted: 86.1%
SI.4 Increased participation rate in CFSA activities for students	35% of students participated in 3 or more activities (Fall 2021)	32%-33% of students participated in 3 or more activities in each term of the Year 2 report (Spring 2022 to Fall 2022)
SI.5 Social justice STEM opportunities increase student interest and motivation in STEM	Data Not Available	N/A
SI.6 Increase in LSAMP URM student graduation rates	8.7% (Summer 2022)	N/A
SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4-year baccalaureate program	Data Not Available	N/A
SI.8 LSAMP URM students feel they belong in STEM at their institution	Science Identity: Average 3.63/5 Identity as Science: Average 3.68/5	Science Identity: Average 4.25/5 Identity as Science: Average 3.70/5
SI.9 Increase in STEM self-efficacy and identity for LSAMP URM students	Research Self-Efficacy: Average 4.21/5 Sources of Self-Efficacy: Average 3.56/5 Confidence as Scientist: Average 3.72/5 Commitment to Science: Average 4.47/5	Research Self-Efficacy: Average 4.43/5 Sources of Self-Efficacy: Average 3.80/5 Confidence as Scientist: Average 3.80/5 Commitment to Science: Average 4.77/5
SI.10 STEM self-efficacy and identity maintained after transfer to 4 year baccalaureate program	N/A	N/A

[23] Baseline timeframe is noted in parentheses next to data for SI.1-SI.6. Baseline data for SI.8 and SI.9 is calculated from all baseline survey responses during the project timeframe.

Strategic Indicator 1: Increase in LSAMP URMs Declaring a STEM Major

The baseline for SI.1 was established in Fall 2021 when 14 (9.2%) LSAMP URM[24] students reported being a STEM major in AY 2021-2022 (Figure 35). Of these 14 LSAMP URM students, eight of them had low participation in LSAMP, and two had on track participation. There was one PHSC student and 13 Valencia students who reported being a STEM major in AY 2021-2022. Seven of the 13 Valencia LSAMP URM students were male and six were female. See Appendix C for additional data tables.

Figure 35. Percent of LSAMP URM Students with STEM Majors in Fall 2021



Strategic Indicator 2: Increase in LSAMP URM Students Maintaining a GPA of 2.75 or Higher

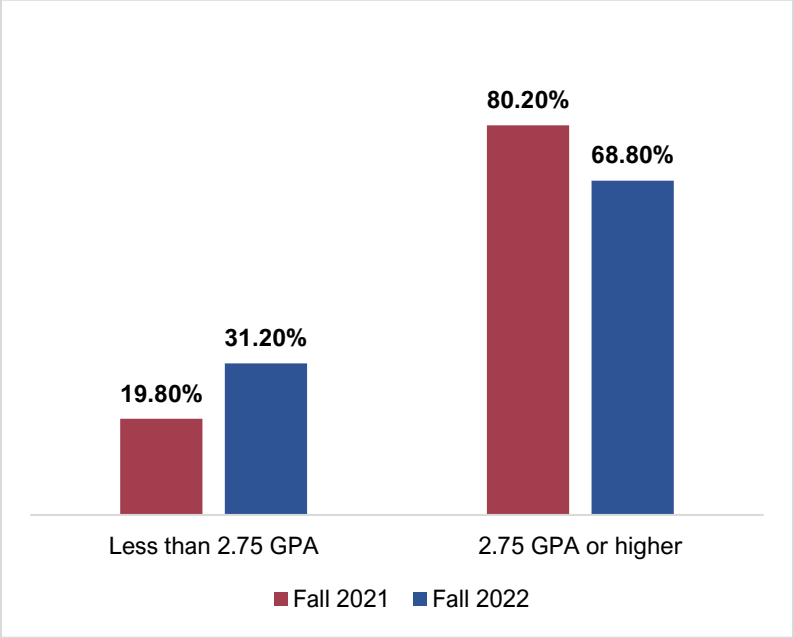
The baseline for this indicator was intended to come from prior LSAMP grant data. While it is not possible to report an aggregate percentage of CFSA LSAMP URM students maintaining a GPA of 2.75 or higher from Fall 2017,[25] the percent of CFSA URM earning a GPA of 2.75 or higher ranged from 37.3% (Polk State College) to 57.8% (Daytona State College) in Fall 2017. Due to the lack of an aggregate percentage, the baseline for LSAMP URM students was established in Fall 2021 with 69 (80.2%) LSAMP URM students maintaining a GPA of 2.75 or higher. There were 53 Polk students and 16 Valencia students who earned a GPA of 2.75 or higher in Fall 2021. While this percentage must serve as the baseline, it is higher than the institutions presented in the Fall 2017 report.

Of the 16 Valencia LSAMP URM students who maintained a GPA of 2.75 or higher in Fall 2021, all had low participation in LSAMP. Six of the 16 were male and ten were female.

[24] LSAMP is open to all students, however, the alliance intends for 90% of participants to be URM students. NSF defines these students as students who identify as Black, Hispanic or Latino, and American Indians or Alaska Natives (https://ncses.nsf.gov/pubs/nsf23315/report/glossary).
[25] The evaluation plan intended to use data from the prior grant as baseline.

In Fall 2022, 75 (68.8%) LSAMP URM students held a GPA of 2.75 or higher, demonstrating an slight decrease in the percent of LSAMP URM students with a GPA of 2.75 or higher. There were 43 Polk students, 3 PHSC students, and 29 Valencia students who earned a GPA of 2.75 or higher in Fall 2022. Of these LSAMP URM students, 21 had low participation in LSAMP, 15 had on track participation, and 5 had high LSAMP participation. Twelve of these 29 Valencia LSAMP URM students were male and eighteen were female (Figure 36). See Appendix C for further data tables.

Figure 36. Percent of LSAMP URM Students Earning a 2.75 GPA or Higher in Fall 2021 and Fall 2022



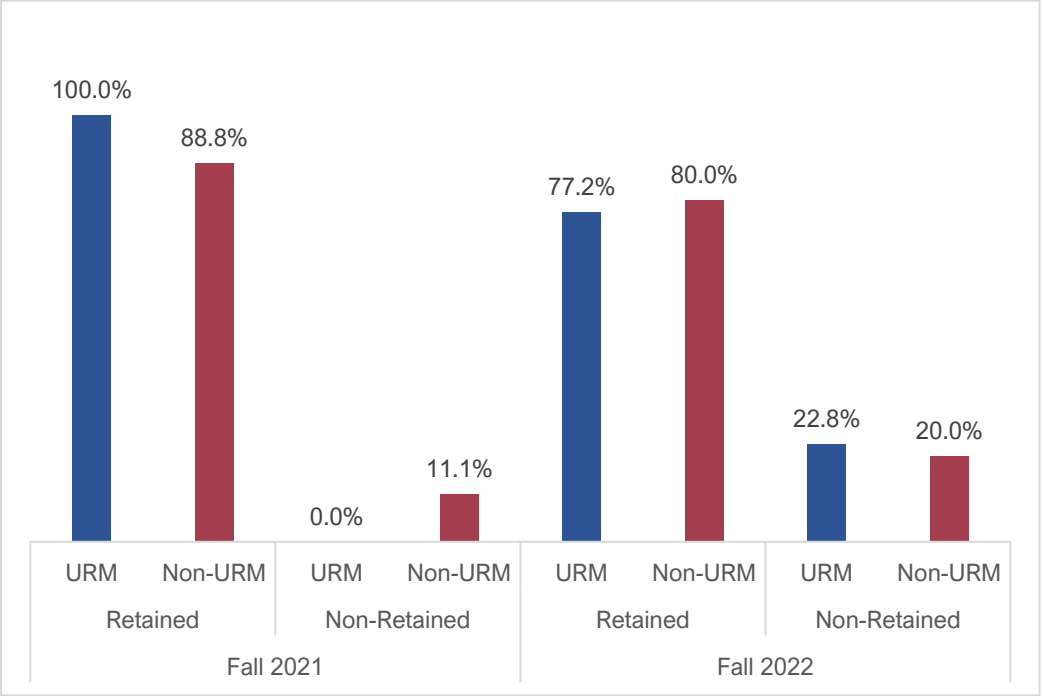
Strategic Indicator 3: Increased Retention and Persistence Rates Compared to Prior Grant Years & Non-LSAMP URM STEM Students

Definitions for retention and persistence indicators were established with each institution:

> *Retention:* The percentage of first-time-in-college students (i.e., students with no prior post-secondary experience) who return to the same institution the following fall.
>
> *Persistence:* The percentage of students who continue enrollment at any institution the following fall.

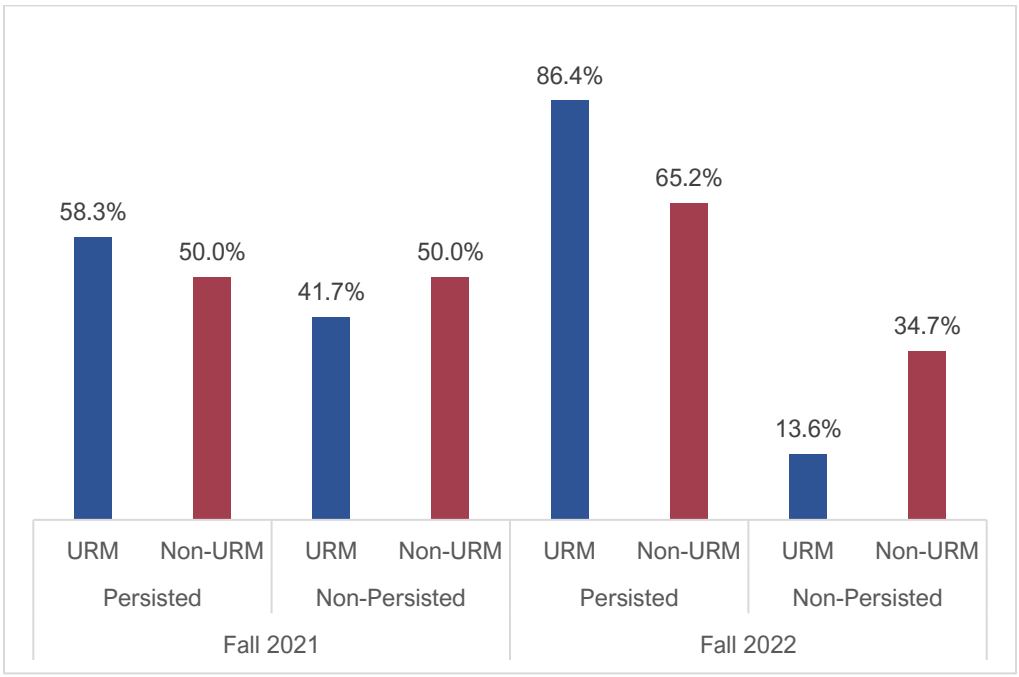
Data from prior grant years was not available at the time of this report; therefore, retention and persistence baselines were established in Fall 2021 with 17 (100%) LSAMP URM students retained. In the following Fall 2022, 74 (50.7%) LSAMP URM students were retained, demonstrating an overall decrease in the percent of LSAMP URM students retained (Figure 37). There were 46 Polk students and 28 Valencia students retained in Fall 2022.

Figure 37. Retention, Fall 2021 and Fall 2022



The baseline for persistence was established in Fall 2021, with 14 (58.3%) LSAMP URM students persisting. In the following Fall 2022, thirty-seven (86.1%) LSAMP URM students persisted, demonstrating an overall increase in the percent of LSAMP URM students persisting (Figure 38). See Appendix C for further data tables.

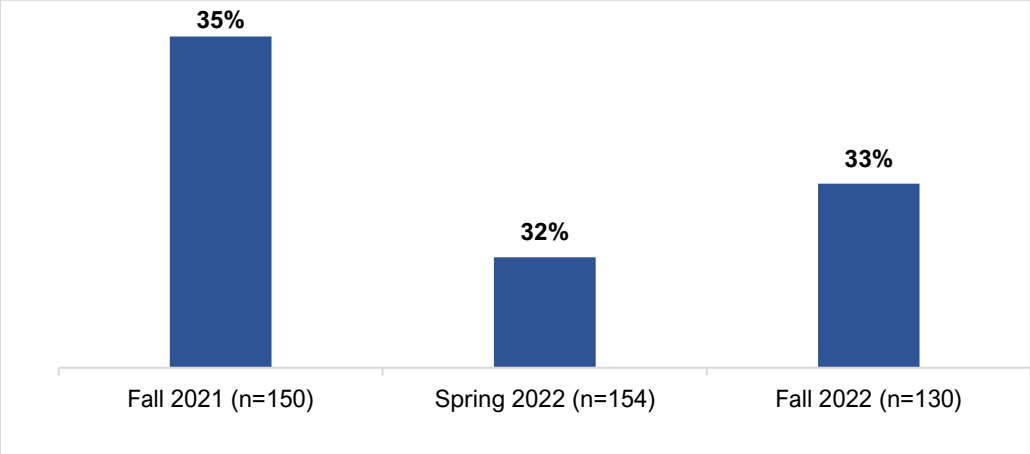
Figure 38. Persistence, Fall 2021 and Fall 2022



Strategic Indicator 4: Increased Participation Rate in CFSA Activities for Students

The baseline for the requirement for LSAMP students to participate in three activities per semester was established in Fall 2021 with 35% of LSAMP members (*n*=52) meeting the participation requirement. The percentage of students meeting participation requirements dropped slightly in Spring 2022 (32%) and Fall 2022 (33%) but ultimately remains similar to baseline (Figure 39).

Figure 39. Percentage of Students Meeting Participation Requirements, By Semester

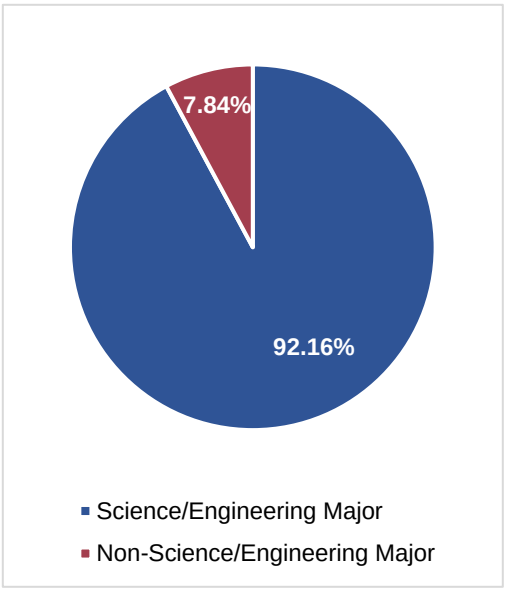


Strategic Indicator 5: Social Justice STEM Opportunities Increase Student Interest and Motivation in STEM

Implementation data currently do not distinguish which activities are social justice-oriented STEM opportunities, therefore it was not feasible to determine how social justice-oriented STEM opportunities affect student interest and motivation in STEM. Moving forward, the evaluator will modify the engagement opportunity log to allow project staff to identify activities that fall into this category. With this adjustment, the evaluator will be able to glean more granular data to determine which students attended social justice-oriented STEM events and if their participation resulted in increased interest and motivation in STEM.

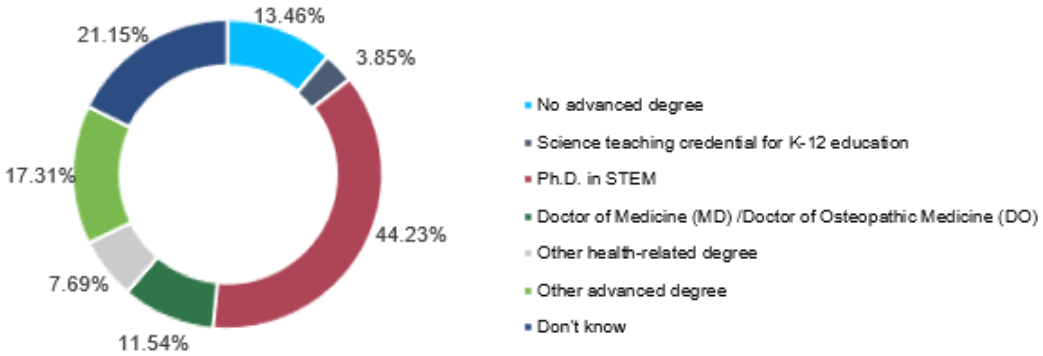
Although student interest and motivation in STEM was not sufficient to be analyzed this year, baseline data on this metric are presented below was established in AY 2021-2022. Of the 52 LSAMP URM students who reported on motivation in STEM in the baseline survey, 47 (92.2%) indicated they planned to graduate as science or engineering majors (Figure 40).

Figure 40. Student Plans for Academic Major (*n*=99)



Of the 52 LSAMP URM students who responded to the *baseline* survey, 23 (44.3%) indicated they wanted to pursue a Ph.D. in STEM after graduation. Of the five LSAMP URM students who responded to the *annual* survey, four students (80%) reported they wanted to pursue a Ph.D. in STEM after graduation (Figure 41).

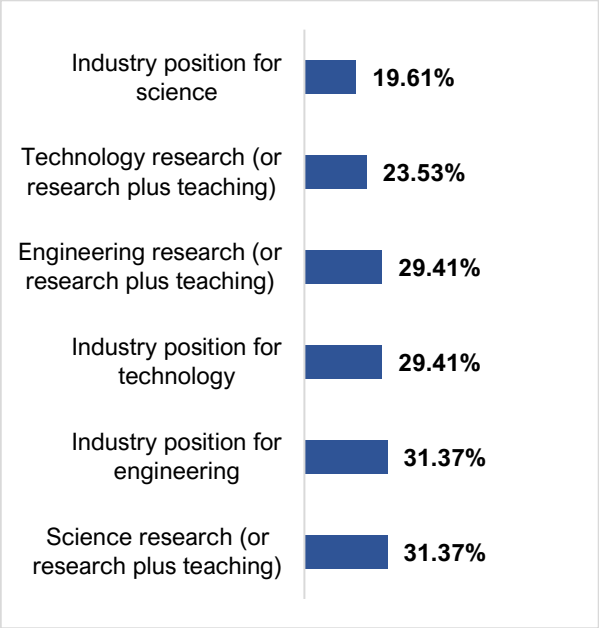
Figure 41. Future Education Plans of URM Students (*n*=51)



Of the 51 LSAMP URM respondents to the *baseline* survey, 16 (31.4%) reported that they wanted to pursue a science research position after graduation. Sixteen (31.4%) indicated plans to pursue an industry position in engineering after graduation. In the *annual* survey, two of the five LSAMP URM respondents (40%) reported plans to pursue careers in science research,

medical research, medical practice, or engineering after graduation (Figure 42). See Appendix C for further data tables.

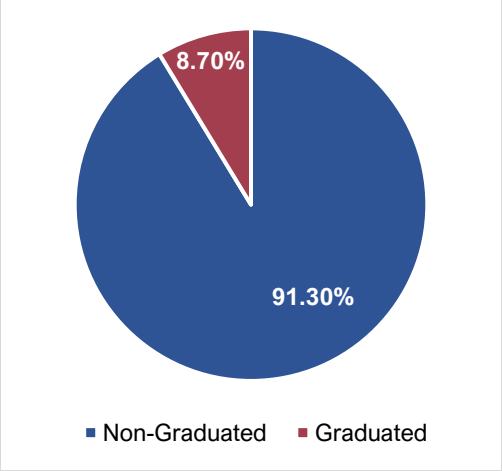
Figure 42. Student Post-Graduation Plans (*n*=51)



Strategic Indicator 6: Increase in LSAMP URM Student Graduation Rate

The baseline for graduation was established in Summer 2022 with eleven (8.7%) LSAMP URM students graduating (Figure 43). There were eight Valencia students and three Polk students who graduated in Summer 2022. Analysis for increase will be conducted in Year 3. See Appendix C for further data tables.

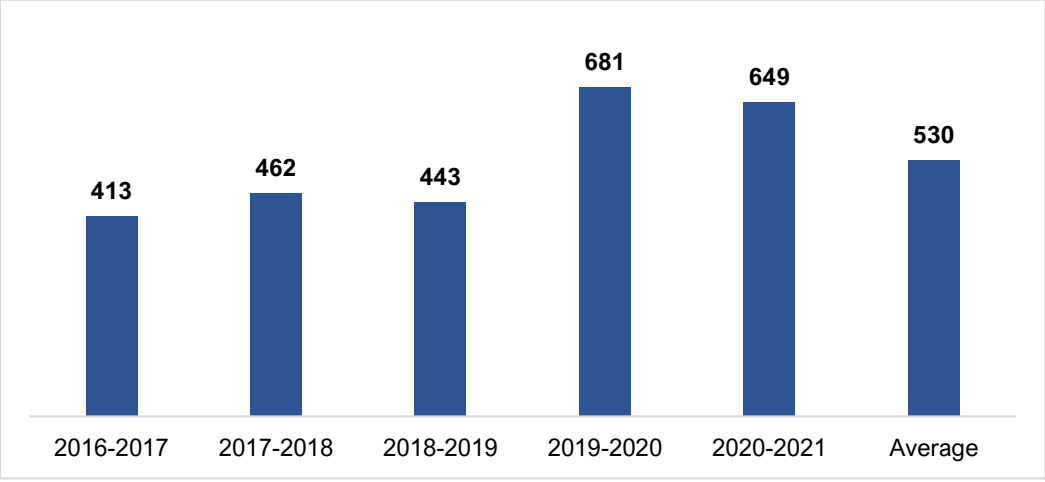
Figure 43. Percent of Valencia LSAMP URM Graduating in Summer 2022 (*n*=35)



Strategic Indicator 7: Increase in LSAMP URM Student Transfer Application and Transfer Rates to STEM Majors in 4-year Baccalaureate Program

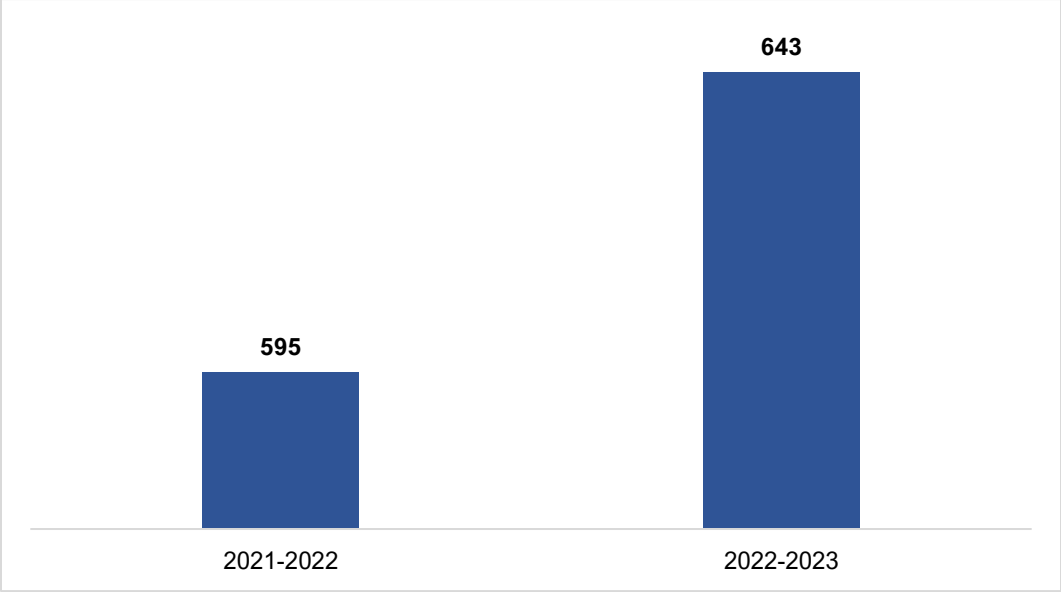
Regional partner universities provide annual counts of STEM URM transfers. The baseline data for this indicator is a 5-year trend from the prior grant. In the first five years of the grant, an average of 530 URM AA students transferred to the regional partner universities from CFSA institutions (Figure 44).

Figure 44. URM AA Student Transfer to Regional Partners, 5-Year Trend Baseline

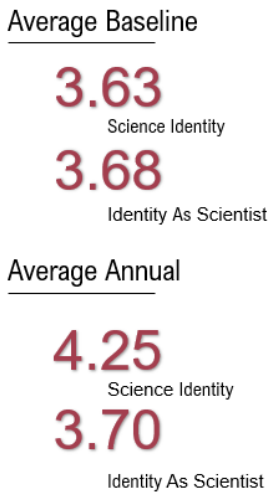


Data were provided from the same regional partner institutions in AY 2021-2022 and AY 2022-2023. The number of transfers has continued to increase from the 5-year trend in the prior grant, of an average of 530 students per year (Figure 45).

Figure 45. URM AA Student Transfer to Regional Partners, Years 1 and 2



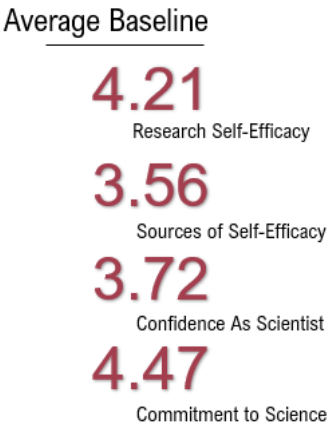
Strategic Indicator 8: LSAMP URM Students Feel They Belong in STEM at their Institution



During AY 2021-2022, the baseline was established for belonging in STEM using the science identity scale to assess how strongly an individual feels aligned to a scientist in their most recent research experience. In the *baseline* survey, 28 LSAMP URM students responded to the survey, reporting an average of 3.63/5 on the science identity scale. In the *annual* survey, four LSAMP URM students responded reporting an average of 4.25/5 on the science identity scale. Disaggregation by LSAMP participation was not possible, as only Valencia College reported participation data. This led to an overlap of five LSAMP URM students responding to the baseline survey and having Valencia report on these students' participation rates in the LSAMP program. The rest of the student respondents in the survey did not have LSAMP participation data.

The identity as a scientist scale assesses how strongly an individual perceives themselves to be a scientist. In the *baseline* survey, 49 LSAMP URM students responded, reporting an average of 3.68/5 on the identity as a scientist scale. In the *annual* survey, the five LSAMP URM respondents reported an average of 3.70/5 on the identity as a scientist scale. See Appendix C for further data tables.

Strategic Indicator 9: Increase in STEM Self-efficacy and Identity for LSAMP URM Students



During AY 2021-2022 the baseline was established for STEM self-efficacy and identity for LSAMP URM students using the research self-efficacy scale. This scale assesses an individual's ability to perform and persist on eleven tasks related to doing research and earning science undergraduate degrees. In the *baseline* survey, 57 LSAMP URM students responded, reporting an average of 4.21/5 (1 = No confidence to 5 = Complete confidence) on the research self-efficacy scale. In the *annual* survey, the seven LSAMP URM respondents reporting an average of 4.43/5 on the annual research self-efficacy scale.

The sources of efficacy scale assesses an individual's performance accomplishments, vicarious learning, social persuasion, and affective/emotional arousal. In the *baseline* survey, seven LSAMP URM students responded, reporting an average of 3.56/5 (1 = Not well at all to 5 = Extremely well) on the sources of self-efficacy scale. In the *annual* survey, two LSAMP URM students responded, reporting an average of 3.80/5 on this scale.

The confidence as a scientist scale assesses an individual's confidence in their abilities to function as a scientist. During AY 2021-2022, 49 LSAMP URM students responded to the *baseline* survey, reporting an average of 3.72/5 (1 = Not at all confident to 5 = Absolutely confident) on the baseline confidence as a scientist scale. In the *annual* survey, five LSAMP URM students responded, reporting an average of 3.80/ 5 on this scale.

The commitment to science scale assesses an individual's intention to continue a career in science. Fifty LSAMP URM students responded to the *baseline* survey, reporting an average of 4.47/5 (1 = Strongly disagree to 5 = Strongly agree) on the commitment to science scale. In the *annual* survey, the five LSAMP URM respondents reported an average of 4.77/5 on this scale. See Appendix C for further data tables.

Supplemental Indicators

Supplemental indicators were developed to provide deeper insight into how participation in certain LSAMP engagement opportunities (e.g., Research Scholars) contributes to anticipated outcomes and how participation affects students' future career plans. The supplemental indicator questions are as follows:

1. To what degree did student participation in each component of the LSAMP program lead to outcomes? Did students realize the outcomes? Do students believe participation in components of the LSAMP program were important contributors to the outcomes?

    1a. STEM Professionalization Experiences

    1b. Mentoring and Relationships with faculty, staff, advisors, and peers

    1c. Summer Bridge

    1d. Student-led STEM skill-building workshops and peer supports

    1e. STEM Identity, Professional Experiences, and Conferences

2. How does participation in the LSAMP program affect students' future career plans?

Unfortunately, Pulse Survey data is used for these indicators and there was a low response rate (see p. 15). Full analysis will be presented in Year 3.

College Impacts

The new LSAMP grant has helped alliance institutions to build capacity and increase cross-institution collaboration. In the first annual evaluation report, it was reported that institutions had built capacity individually, by collaborating with different departments and developing new procedures. In addition, the presidents of all four LSAMP institutions attended the first governing board meeting in January 2022. During this meeting, the presidents were updated on LSAMP's progress in Fall 2021. The presidents shared their hopes for the future of the alliance, expressed support for the project's goals and contributed ideas to increase project visibility and improve implementation. The four college presidents also attended the May and November 2022 Governing Board Meetings where they heard from the LSAMP Alliance Director on the progress made by each of the partner institutions. Each president presented an overview of LSAMP implementation on their respective campuses, which reflects a level of presidential involvement and awareness that bodes well for the alliance.

Notably, the influx of funding expanded support for students through staffing and additional opportunities. Institutions hired advisors who provided dedicated STEM advising and supported STEM Club programming. The funding expanded the capacity of staff to engage students in stipend-supported undergraduate research and conferences, which would not have been feasible due to travel and registration costs without the funding provided by LSAMP.

During the evaluator's annual site visit, a student affirmed that LSAMP had completely changed their community college experience and expressed motivation to get other students involved in LSAMP: "*I need to get people to join this thing because this is something that's impacting people's lives*."

Finally, LSAMP propelled an increased focus on undergraduate research at the partner institutions. While Valencia College already had undergraduate research on their campuses, research opportunities were limited at the other institutions. Polk State College has been able to integrate a few opportunities for students through the efforts of several faculty members, and the College of Central Florida has developed an opportunity through their Vintage Farm. However, the LSAMP teams at Polk State College, College of Central Florida, and Pasco-Hernando State College still find this aspect of the grant challenging. Consequently, the alliance partner institutions have engaged in ongoing dialog amongst themselves and with other local institutions about how to develop more research opportunities in the future. For example, they are discussing ways in which students can engage in research projects that do not require extensive equipment to complete (e.g., designing studies, working with available data). The LSAMP teams are also exploring ways to share opportunities across the alliance and work with other institutions such as the University of South Florida to offer research experiences to LSAMP students.

Chapter Five: Recommendations

The following recommendations offered for consideration are based on findings from the first two years of LSAMP project implementation:

Recruitment

1. **Consider additional strategies to intentionally recruit students from URM groups:** Some of the LSAMP teams have partnered with other campus programs (e.g., VECTOR, TRiO, CROP) that serve URM students. The alliance could replicate these kinds of partnerships across all the partner institutions. Other options include having LSAMP members talk about their experiences at local high schools, developing a recruitment video featuring LSAMP members to share broadly, and sending information about LSAMP to local college fairs.

2. **Prepare a brief presentation on LSAMP to share with appropriate faculty/staff at each partner institution:** Project staff noted the importance of ensuring faculty, staff, and advisors at each institution know what LSAMP is so they can guide students to this opportunity. In Year 2 (Spring 2022 through Fall 2022), some institutions implemented this practice. Collaboratively the alliance may wish to consider drawing on the resources each institution has created to develop an LSAMP presentation that can be used alliance-wide. This could be structured in template format with broadly generic information and space for project staff at each institution to insert information specific to their program. The presentation can be shared with advisors, student services, and STEM faculty. If not feasible, a one-page fact sheet or letter may suffice.

3. **Utilize advisors as recruiting partners.** While advising structures vary, all advisors are well positioned to serve as excellent recruiting tools given their regular engagement with students. If possible, all alliance institutions should engage in yearly institution-led opportunities for advisors to learn about changes to program requirements. However, if not feasible, LSAMP project staff should individually reach out to and meet with advisors. Providing advisors with fliers and other LSAMP resources will support recruitment efforts.

Student Engagement

1. **Share engagement opportunities with LSAMP alliance partner institutions:** While there has been continued progress sharing opportunities across institutions (e.g., Research Experiences for Undergraduates Workshop Series), this aspect can be elevated as a priority. Many of these in-person opportunities could have a virtual option for students from other institutions to attend. During cross-institution advisor meetings, advisors could discuss upcoming events over the next several months to support collaboration.

2. **Continue to coordinate with alliance partner institutions on planning STEM lab/industry and college tours.** In Year 2, collaborative efforts among the partner institutions resulted in beneficial tours for students. Combining small groups of students into one larger alliance group may make it easier to book tours at the large four-year universities. Consider pairing one the more established institutions (i.e., Valencia, Polk

State) with the newer institutions (i.e., College of Central Florida, Pasco-Hernando) to collaborate on planning these vital activities or planning for them at cross-institution advising meetings.

3. **Develop a master list of REU opportunities.** Some institutions have more experience with REUs than others. Creating a master list of REUs offered in the past may help LSAMP advisors to connect students to REU opportunities in the upcoming year. Creating the master list as a living document (e.g., Google Sheet) would allow stakeholders to update it with links in real time as opportunities are announced.

4. **Collaborate across institutions to plan research opportunities.** While faculty-led research or sophisticated tools may not be widely available to all the LSAMP partner institutions, there are ways to engage students in the research experience even without extensive equipment. Using common tools and pre-existing data to engage students in study design is an option. Developing a list of ideas/hand-on project plans in this domain that can be used across the alliance will provide ready-to-go research opportunities that can be shared with all LSAMP students. Some institutions may be able to use virtual platforms to allow students to work from afar with faculty at non-alliance institutions. .

Faculty Focused Activities

1. **Continue to provide time for CFSA work groups to connect and report at quarterly meetings:** CFSA work group lists were modified in Year 2 to address the overlap that impeded work group progress in Year 1. Now CFSA work groups are well positioned to collaborate and report at quarterly meetings.

2. **Clarify the purpose and scope of the work groups:** Feedback from stakeholders indicated uncertainty as to the role the work groups and the nature of their deliverables. Alliance leadership should take time to define these aspects so that each work group has a clear goal and members feel their time is being well spent on deliverables that benefit the alliance.

3. **Provide cross-institution workshops for faculty.** Now that institutions have been able to identify supportive faculty members at their institutions, the alliance should offer faculty workshops. It may be particularly beneficial to ask faculty for their input and ideas on undergraduate research experiences that are hands-on but do not require sophisticated equipment.

Evaluation and Reporting

1. **Provide clarification to staff about which students should be included in data collection:** Data for the evaluation report included students who were being served by LSAMP advisors but who were not LSAMP members at two of the institutions. While there was some progress in Year 2, this remains a challenge. Clarifying the correct data to enter on these forms with staff responsible for data collection will be key to ensuring a successful evaluation. Co-PIs should review the data before submitting it to ensure the

number of students matches in all the logs (i.e., student information /demographics form, student activity log, advising log).

2. **Revise data forms to collect details about engagement opportunities:** While the evaluator can identify certain types of activities (e.g., conferences, workshops), additional detail is needed to ensure that project activities are accurately tracked. Adding columns where project staff can indicate if the activity focuses on STEM social justice or is an informal peer opportunity (e.g., study group) will allow the evaluator to provide more detailed information on student outcomes.

3. **Encourage staff members to track activities during the semester:** Completing the required tracking logs at the end of each semester is not conducive to accuracy. Encouraging project staff to regularly enter activities in the tracking logs throughout the semester. Doing so on a routine basis will ease the burden of providing the data and increase accuracy, particularly with informal engagement opportunities.

4. **Implement new methods to increase student response rate to surveys and feedback forms:** Improving the student response rate on forms and surveys should be a priority going forward. Consider having students complete surveys at the end of an LSAMP meeting. The evaluator will work with project staff to determine which practices would be most beneficial to implement across the alliance.

Appendices

Appendix A: Evaluation Plan

EVALUATION PLAN

Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement 2021-2024

November 5, 2021

SHAFFER Evaluation Group

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INTRODUCTION

Purpose of Study

The purpose of this evaluation is to conduct a comprehensive evaluation of the Study of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement (CFSA Paths) project. The evaluation will provide information to improve the project as it develops and progresses. Information is collected to help determine whether the project is proceeding as planned and whether it is meeting its stated program goals and project objectives according to the proposed timeline.

Project Background

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by LSAMP B2B funding from the National Science Foundation, seeks to strengthen the STEM educational ecosystem in Central Florida to support historically underrepresented minority (URM) students. This ecosystem is an interconnected, intentional network striving to support STEM education and literacy and to enhance college readiness and success in STEM through thoughtful engagement in proven and innovative strategies. This current project leverages the experience and success of the previously funded CFSA projects (HRD #1304966, HRD #1712683) and the comprehensive LSAMP model, while proposing innovative, evidence-based strategies to maximize opportunities in STEM for URM, community college students. This project builds on the Alliance's previous experience and evidence of success in supporting URM student recruitment, retention, and progression to four-year STEM degree programs. Valencia College (VC), a designated Hispanic-Serving Institution (HSI), will collaborate with community college partners, the College of Central Florida (CF), Pasco-Hernando State College (PHSC), and Polk State College (PSC). The project will deepen the STEM experience and engagement of LSAMP students, and ensure they are prepared to succeed in STEM baccalaureate programs. CFSA Paths also intends to achieve a 30% net increase in the number of URM students who successfully transfer into STEM baccalaureate degree programs over the three-year project period. This project will adapt best practices from the significant results of the CFSA and will specifically address barriers impacting success in STEM pathways for the large number of racially and ethnically minoritized students within Central Florida. Partners include: Florida Agricultural and Mechanical University (FAMU), a historically black institution (designated

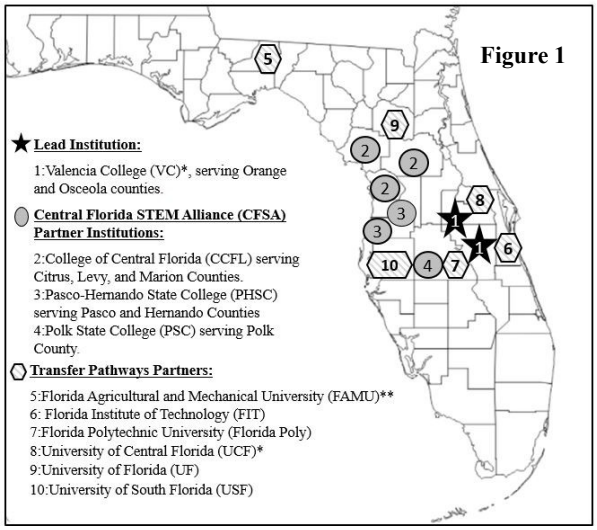


Figure 1

Table A: Credit Program and URM Enrollment in CFSA Comparisons

College Name	Total Enrollment	URM % Enrollment
CF	8,666	31%
PHSC	10,690	30%
PSC	8,225	42%
VC	61,209	56%
CFSA Total	**88,790**	**49%**
FL Community Colleges	**482,479**	**49%**
US Community Colleges	**8,200,723**	**39%**

Source: Florida College System, Fact Book 2020, Credit Program Enrollment 2018-2019 4.3.8T; National Center for Education Statistics, Number of Students Enrolled in Postsecondary Institutions by Sector and Race/Ethnicity, 2018-2019.

HBCU); Florida Institute of Technology (FIT), Florida Polytechnic University (Florida Poly); University of Central Florida (UCF), a HSI; University of Florida (UF); and University of South Florida (USF).

The CFSA intends to grow and deepen partnerships with Florida State University System institutions to support data sharing and transfer pathways. The Alliance serves a diverse geographic area that expands over eight counties, including both small, rural communities and larger, metropolitan areas.

Broader Impacts

As open access institutions, the CFSA community colleges provide an educational entry point for a significant number of Central Florida's racially and ethnically minoritized students, many of whom may also identify as low-income and first-generation-college students. URM students comprise 49% of enrollment across the CFSA. More than half of STEM undergraduate degree holders nationally begin their educational pathway at a community college (Crisp et al., 2009). These institutions represent a critical access point to higher education for African American and Hispanic students. While 41% of all undergraduates are enrolled at community colleges across the United States, 56% of Hispanic students and 44% of African American students enroll in community colleges (Shapiro et al., 2017).

This project focuses on the critically important and growing role of community colleges in advancing strategies and practices that support URM, STEM-degree seeking students. The CFSA is able to actualize opportunities to work across institutions and organizations to broaden the impact of the collective effort, and subsequently shift conversations and perceptions about the nature and value of STEM readiness and education at two-year colleges. The CFSA continues to develop strategies to engage minoritized students in high impact practices recognized for motivating STEM student persistence and supporting development of a scientific identity, such as early research experiences and membership in STEM learning communities (Graham, et al., 2013). These strategies are shared with other LSAMP B2B alliances, such as the Tampa Bay Bridge to the Baccalaureate Alliance (TB-B2B; HRD# #1712738), Metro Denver STEM Alliance (MDSA; HRD# #1812648), and Puget Sound Alliance (during its Pre- Alliance Planning stage). These efforts will support enhancing LSAMP B2B Alliances nationwide.

The CFSA assists other community colleges in the development of enhanced capacity to work effectively in their unique setting and increase the involvement and success of two-year colleges in strategies supporting URM students in STEM. The project will analyze the associated data from CFSA strategies and practices to support development of interventions at community colleges to significantly increase diversity in STEM. These interventions will also benefit students from various backgrounds, including adaptations in secondary and upper division.

The CFSA optimizes opportunities for the currently enrolled 88,790 URM, degree seeking students at the partner institutions, helping to enhance and diversify STEM educational and workforce development efforts in the Central Florida region. The CFSA network between secondary education, community colleges, four-year institutions and Bridges to Doctorate graduate programs offers minoritized students viable pathways to STEM degrees. The project builds upon the highly successful transfer model, DirectConnect to UCF (DirectConnect), which is in its 15th year. The project supports the growth of more recently established transfer programs in Florida, the USF FUSE to Academic Pathways (FUSE) program and the IGNITE program at FAMU. These programs guarantee community college students admission into the upper division and provide transfer student services helping to create a seamless transition. The CFSA serves as the nexus of Central Florida's STEM ecosystem, providing the backbone for collective efforts. The CFSA grows relationships with students, families, K-12, community organizations, industry partners, government agencies, and other institutions of higher education. These relationships create more opportunities for URM STEM degree-seeking students across the region and state.

STUDY DESIGN

The SEG study design includes (a) process evaluation to monitor implementation and provide feedback that goes beyond forming short-term solutions as well as (b) outcome/effectiveness evaluation to determine progress in the intended outcomes of the project. The process evaluation monitors activity-level (e.g., Summer Bridge, advising, student-led STEM skill-building) indicators, ultimately using these to determine correlations to short-term student outcomes (e.g., student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate). The outcome/effectiveness evaluation includes 10 strategic indicators across two goals. Several indicators will be used for a quasi-experimental design study utilizing a comparison group to assess the program's impact on student mid- and long-term outcomes.

Primary data sources include pre-existing scales on STEM perseverance and belonging (Syed, et al., 2018), STEM identity and STEM self-efficacy (Byars-Winston, et al., 2016), annual surveys (including a baseline survey and pre-transfer survey), institutional student records, graduation and retention rates, and focus group and interview data from faculty, staff, and students.

Project Goals and Objectives

The project goals and objectives below were presented in the CSFA Paths grant application to NSF.

Project Goals and Objectives	
Goal 1:	LSAMP, underrepresented minority, STEM students are better prepared to succeed in STEM baccalaureate programs.
Baseline Data:	The CFSA identified a baseline of 181 students participating in 30 or more hours of LSAMP activities in 2018-2019, evidencing deep engagement.
Objective:	By Year 3 (2024), the CFSA will 1) deeply engage URM students in 176 experiences as Community Interns, Research Scholars, and/or Peer Coaches supporting STEM professional experiences at alliance colleges and/or with university, industry, governmental, and community partners; and 2) support at least 24 additional URM students to participate in 30 hours of other activities promoting ongoing success in STEM as general LSAMP students.
Rationale:	The objective is ambitious yet attainable as the CFSA previously engaged 181 students in 30 or more hours of LSAMP activities. The number of deeply engaged and general LSAMP students is readjusting. The strategies for engaging students include diversified student roles as Community Interns, Research Scholars, or Peer Coaches. The CFSA will also use pandemic informed technology strategies to support virtual participation in LSAMP activities providing more opportunities for inclusion. Strategies will result in increased self-efficacy and development of a STEM identity and sense of belonging, preparing students for success in STEM baccalaureate degree programs.
Goal 2:	Increase the number of underrepresented minority students who successfully transfer into STEM baccalaureate programs.
Baseline Data:	The CFSA identified a baseline of 451 student transfers into STEM baccalaureate programs, which is the median of four years of CFSA student data (2016/17 – 2019/20).
Objective:	By Year 3 (2024), the CFSA will achieve a 30% net increase over the baseline number of successful URM transfers into university bachelors degree STEM majors. The objective will examine the net value of transfers over the grant period.

Rationale:	The objective is supported by the baseline data, a median point for four years of data, but moderated to account for the effects of the CFSA restructure (new, fourth community college partner) and the global pandemic. Historic data indicates regular fluctuations in transfer data year to year, but the pandemic will have a significant impact on student enrollment and transfer, particularly in URM student populations (National Student Clearinghouse, 2020). The objective is ambitious as community college undergraduate enrollment is down 9.4% nationally, yet attainable as the CFSA increased the number of transfers by 53% from the Year 1 baseline during the previous project period and will build upon comprehensive, evidence-based approaches supporting student transfer.

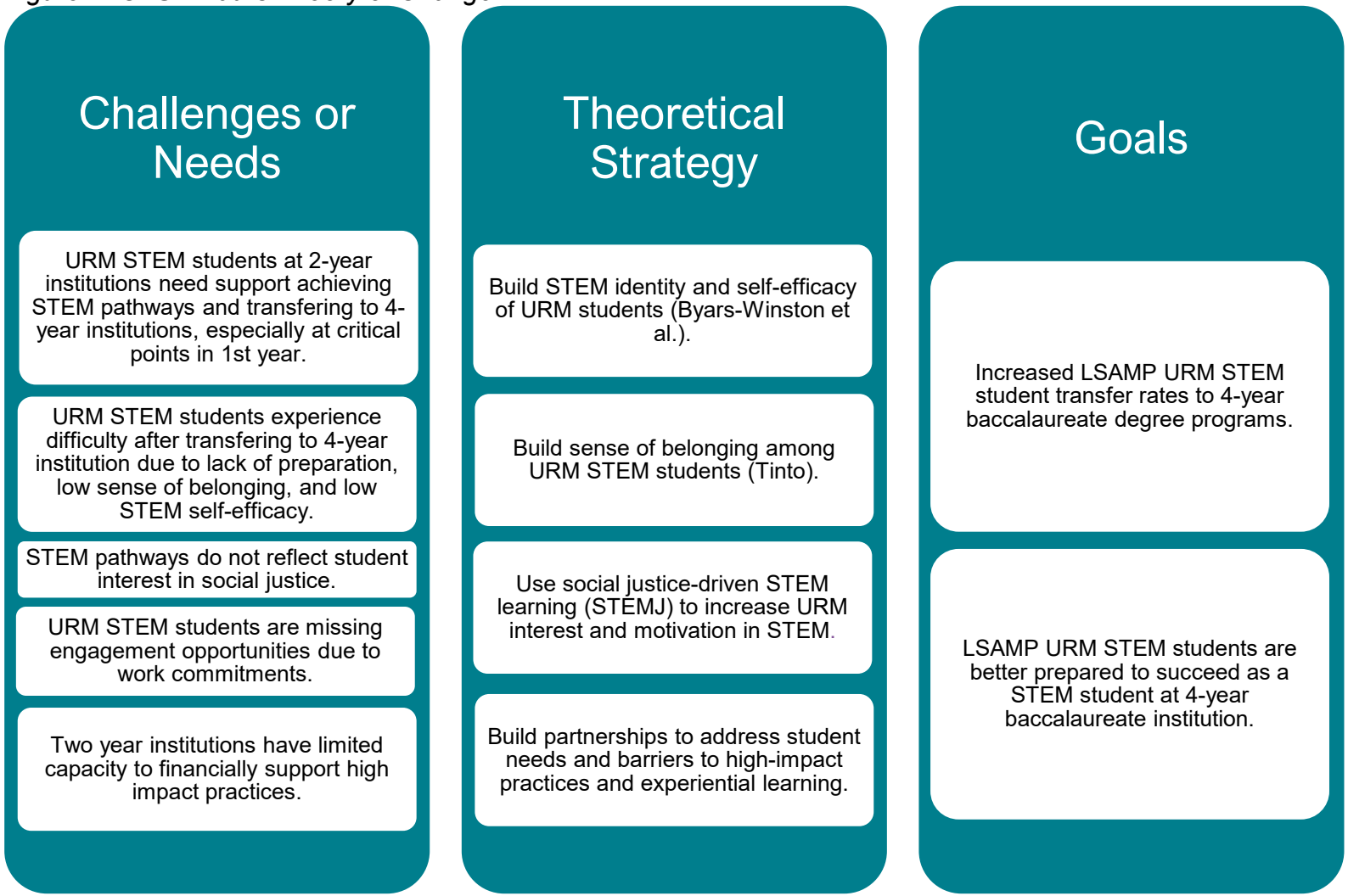
Theory of Change and Logic Models

The Theory of Change (ToC) provides a graphic representation of how change will occur in the program and the basic assumptions being made in the theory and evaluation. The purpose of a ToC model is to test plausibility and is the foundation for the program logic model.**1**

The challenges or needs the program addresses focus on building STEM**2** pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.**3** Contributing to these larger challenges are a lack of preparation, low sense of belonging, low STEM self-efficacy, lack of inclusion of social justice, challenges related to work commitments, and a need for funding to support high-impact practices at two-year institutions. The program employs social justice STEM learning, experiential learning, partnerships to address student needs, programming to build STEM self-efficacy, STEM identity, and sense of belonging intended to result in increased student transfer rates to four-year baccalaureate degree programs and increased success as STEM students at four-year institutions (Figure 1).

1 Lisa Wyatt Knowlton and Cynthia C. Phillips, *The Logic Model Guidebook,* London, Sage Press, Chapter 1.
2 "STEM education" is defined as teaching and learning in the fields of science, technology, engineering, and mathematics. It typically includes educational activities across all grade levels— from pre-school to post-doctorate—in both formal (e.g., classrooms) and informal (e.g., afterschool programs) settings. H. Gonzalez and J. Kuenzi (2012), *Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer*, Washington, DC, Congressional Research Service. https://sgp.fas.org/crs/misc/R42642.pdf.
3 Historically underrepresented minority students are defined as Black or African American, Hispanic or Latino, and American Indian or Alaska Native students.

Figure 1: CFSA Paths Theory of Change



The program logic model provides a detailed map of strategic objectives, outputs, baseline measures, outcomes, and goals for the program. The purpose of a program logic model is to *test feasibility* and to show the causal connections within the program.**4** The program logic model (Figure 2) maps the theory of change to the program's short-, mid-, and long-term outcomes, showing how they relate to the program goals.

4 Lisa Wyatt Knowlton and Cynthia C. Phillips, *The Logic Model Guidebook*, London, Sage Press, Chapter 1.

Figure 2: CFSA Paths Program Logic Model

Goal	Strategic Objective	Activities	Outputs (Examples)	Baseline	Outcomes			
					Short-Term		Mid-Term	Long-Term
1. Increased LSAMP URM STEM student transfer rates to 4-year STEM baccalaureate degree programs	1.1 Build sense of belonging of LSAMP URM STEM students	Student & Faculty Focused Activities: Summer Bridge; Dedicated STEM Academic Advising (STEM pathways advising); Diversity and Inclusion in STEM (faculty development), Faculty & Staff Engagement (faculty involvement in co-curricular activities); Student Recruitment & Engagement; Student-Led Skill Building & Peer Support (peer-led support)	# of participants in Summer Bridge activities, advising, coaching, workshops, Summer Bridge, STEM Club; # of faculty trained/engaged Frequency of engagement each student; Average time in LSAMP activities per student	LSAMP student sense of belonging at start of Summer Bridge; retention & persistence rates of LSAMP & non LSAMP students	Increased sense of belonging after 1 semester of advising, Summer Bridge, Orientation	Increased persistence rates semester 1 to 2	LSAMP URM students report high sense of belonging at completion of STEM core courses	Increased 1st year retention rates
	1.2 Build STEM self-efficacy & identity of LSAMP URM STEM students	Student & Faculty Focused Activities: Summer Bridge (math course placement), STEM Professionalization Experiences (Community Intern, Research Scholar), STEM Identity, Professional Experiences & Conferences (conferences, STEM identity), Student-Led Skill Building & Peer Support (peer-led support), Faculty & Staff Engagement *Skill-focused*	# of students placed in math courses # of participants in workshops, # of community interns, research scholars, conference student attendees, peer coaches, mentees, # of faculty trained/engaged Frequency of engagement each student; Average time in LSAMP activities per student	Number LSAMP participants prior years, GPA of LSAMP & other STEM URM students	Increase in LSAMP URM students (increase in URM students declaring STEM major)	Increase in LSAMP URM students (increase in URM students declaring STEM major)		
		Student & Faculty Focused Activities: Student-led STEM Skill Building & Peer Support (peer-led support, STEM club), STEM Identity, Professional Experience & Conferences (field trips, college & industry tours, STEM identity); Faculty & Staff Engagement *Persuasion/modeling focused*	# of coaches, peer mentors, mentees, coached students, club members, tours & participants, faculty involved Frequency of engagement each student; Average time in LSAMP activities per student	STEM self-efficacy & identity score at start of Summer Bridge; Number of STEM experiences prior to Summer Bridge	Increased STEM self-efficacy & identity after 1 semester of advising & STEM core courses		Increased STEM self-efficacy & identity score after completion of 2 major HIP activities (internship, research scholar, conference, peer coach)	Increased graduation rates for LSAMP students
	1.3 Use social justice-driven STEM learning (STEMJ) to increase URM interest and motivation in STEM	Student Focused Activities: STEM Professionalization Experiences (Community Interns)	# of completed and incomplete internships, interns Average time in internships per student	Engagement rates prior to Community Internship; Motivation in STEM scores; number of LSAMP students; STEM self-efficacy & identity score at start of Summer Bridge	Increase in LSAMP URM students (increase in URM students declaring STEM major); Increase in engagement rates; Increase in Motivation scores	Increased STEM identity after engagement with Community Interns program		
	1.4 Build partnerships to address student needs and barriers to high impact practices and experiential learning	Institution Focused Activities: Targeted STEM Pathways (STEM articulation agreements, data taskforce)	# of new or enhanced articulation agreements; # of students in new majors and transfer applicants	Transfer rates prior grants; graduation rates prior grants; Average number of transfer applications prior grants	Increase in LSAMP URM students (increase in URM students declaring STEM major)	Increased retention end of first year core STEM courses;	Increased graduation rates for LSAMP students	Increased transfer application rates LSAMP URM students

	Strategic Objective	Activities	Outputs (Examples)	Baseline	Outcomes		
					Short-Term	Mid-Term	Long-Term
2. LSAMP URM STEM students better prepared to succeed as STEM student at 4-year baccalaureate institution	2.1 Build STEM self-efficacy and identity of URM STEM students	Student and Faculty Focused Activities: Student-led STEM Skill Building & Peer Support (peer-led support), STEM Professionalization Experiences (community interns, research scholars), STEM Identity, Professional Experiences & Conferences (STEM conferences, STEM identity), Summer Bridge (math course placement), Faculty & Staff Engagement Skill focused	# of community interns, research scholars, conference & workshop participants, STEM Club members, peer coaches & coaching sessions, # of faculty trained/engaged # of students placed in math course Frequency of engagement each student; Average time in LSAMP activities per student	STEM self-efficacy score at graduation; baccalaureate institution persistence and retention rates for LSAMP and non LSAMP STEM URMs	LSAMP transfer students report feeling well prepared for transfer to baccalaureate	LSAMP transfer students maintain sense of STEM self-efficacy 1 year after transferring	Baccalaureate institution persistence & retention rates for LSAMP and non LSAMP STEM URMs (not measured)
		Student and Faculty Focused Activities: Student-led STEM Skill Building & Peer Support (peer-led support), STEM Identity, Professional Experiences & Conferences (college & industry tours, STEM identity), Faculty & Staff Engagement *Persuasion and modeling focused*	# of peer mentors, mentees, STEM club members, tours & participants; # of faculty trained/engaged Frequency of engagement each student; Average time in LSAMP activities per student				
	2.2 Use social justice-driven STEM learning (STEMJ) to increase URM interest and motivation in STEM	Student Focused Activities: STEM Professionalization Experiences (Community Interns)	# of completed and incomplete internships, interns Average time in internships per student				
	2.3 Build partnerships to address student needs and barriers to high impact practices and experiential learning	Institution Focused Activities: Targeted STEM Pathways (STEM articulation agreements, data taskforce)	# of new or enhanced articulation agreements; # of students in new majors and transfer applicants	Transfer rates prior grants; graduation rates current and prior grants			

Evaluation Framework

The evaluation framework provides an overview of the evaluation plan by mapping the evaluation questions to expected outcomes, the data needed, the instrument to collect the data, and the analytical methods. The evaluation uses a mixed methods approach to fully understand the implementation context and triangulate data.

The evaluation data collected will be used to measure the extent to which the goal and associated indicators were met, or is on track to be achieved, providing the coalition with information needed to adjust strategy or redeploy resources in order to accomplish their goals.

Process Evaluation

The evaluator will work with the project team to monitor fidelity of implementation of the CFSA Paths Activity Framework across the Alliance. Fidelity of implementation is defined as how well an intervention is implemented in comparison with the original program design (O'Donnell, 2008). Guiding evaluation questions for monitoring CFSA fidelity of implementation are:

1. To what extent were the key components of the CFSA Paths Activity Framework implemented with fidelity?

2. What was the amount of variation in implementation fidelity?

3. What was the relationship of fidelity of implementation to short-term outcomes associated with student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate?

To respond to the first two questions, the evaluator will work with the project team to refine fidelity matrices to include threshold levels of fidelity of implementation for each focus area of the Paths Activity Framework. Threshold levels in the fidelity matrices will be updated at the end of the first year prior to the initiation of second year programming. These focus areas include:

- Student Focused Activities (i.e., Summer Bridge Program; Student Recruitment and Engagement; Dedicated STEM Academic Advising; Student-Led STEM Skill-Building and Peer Support; STEM Identity, Professional Experiences and Conferences; STEM Professionalization Experiences through Paths to Engagement)

- Faculty Focused Activities (i.e., Diversity and Inclusion in STEM; Faculty and Staff Engagement)

- Department/Institution Focused Activities (i.e., Targeted STEM Pathways)

Each fidelity matrix (figures 3-5) establishes clear indicators and definitions for each focus area and each of its activities and identifies thresholds for implementation. Fidelity of implementation will be reported at the Alliance and campus levels. Data sources for tracking fidelity of implementation provide evidence of implementation and student/faculty participation and satisfaction with the activities. Key sources for tracking fidelity include activity participation records; campus-provided documentation of events and activities; feedback forms administered to students and faculty after events (e.g., Summer Bridge Program, faculty training events) and annual surveys administered to students and faculty at the end of each academic year; and annual interviews and focus groups with project staff and a stratified sample of faculty and students across the Alliance. To support alliance members in tracking evaluation activities, a series of logs have been developed. Appendix B includes logs and instruments.

The first question will also include calculation of a fidelity index. The fidelity index (figure 6) is determined by selected key indicators from the fidelity matrices. Each indicator includes criteria to calculate an institution level score. Then, the scores from each institution are used to calculate an alliance level score. Each indicator includes criteria to calculate the alliance level score. Next, fidelity is determined for each indicator using the threshold for fidelity. The threshold for fidelity is the alliance level score that is considered at fidelity. Finally, the number of indicators that met the threshold for fidelity is divided by the total number of indicators to determine the fidelity index as a percentage. The project will be considered "on target" if the fidelity index is above 80%, roughly equivalent to the letter grade performance of a "B". Please note, the fidelity index also includes an expected year of fidelity measurement which varies due to when data will be available.

To respond to the third question, the results of the fidelity of implementation analysis will be correlated to short-term student outcomes (student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate). Data sources for short-term outcomes include institutional student records on enrollment, grades, persistence, and retention, activity participation records, and the annual student survey. Faculty and student focus groups and interviews will collect suggestions for program improvement.

The draft fidelity matrices are included in the figures 3 to 5. The fidelity index is included in figure 6. Thresholds for unit-level implementation will be established with evaluation liaisons after Year 1 data is collected.

Figure 3: Student Focused Fidelity of Implementation Matrix

Summer Bridge Program				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF 1: Summer Bridge Experience for Incoming College Students	**SF 1.1:** High school seniors and first time in college students participate in the Summer STEM Institute.	Number of student participants in Summer STEM Institute	% of students who participate in Summer STEM Institute	Detailed Implementation Report; Rosters of Summer STEM Institute program
	SF 1.2: Summer STEM Institute includes workshops and presentations by STEM professionals and college/university faculty.	Number of workshops and presentations by STEM professionals and college/university faculty	# workshops and presentations by STEM professionals and college/university faculty	Detailed Implementation Report; Schedule from Summer STEM Institute
	SF 1.3: Summer STEM Institute will be offered in hybrid/virtual modalities.	Evidence of hybrid/virtual modality offered	Evidence of hybrid/virtual modality offered	Detailed Implementation Report; Schedule from hybrid/virtual Summer STEM Institute
	SF 1.4: Summer STEM Institute activities include hands-on STEM Activities.	Evidence of hands-on activities at Summer STEM Institute	Evidence of hands-on activities	Detailed Implementation Report; Schedule from Summer STEM Institute; other documentation (e.g., photos)
	SF 1.5: Summer STEM Institute includes STEM Career Pathway activities.	Evidence of STEM Career Pathway activities at Summer STEM Institute	Evidence of STEM Career Pathway activities	Detailed Implementation Report; Schedule from Summer STEM Institute
	SF 1.6: Summer STEM Institute includes information on institutional resources and tools to support college readiness and success.	Evidence of sharing information on institutional resources and tools to support college readiness and success at Summer STEM Institute	Evidence of sharing information on institutional resources and tools to support college readiness and success	Detailed Implementation Report; Schedule from Summer STEM Institute; other documentation (e.g., photos, copies of resources)
	SF 1.7: Summer STEM Institute includes activities to learn about the UN Sustainable Development Goals (UN-SDGs).	Evidence of activities on the UN-SDGs at the Summer STEM Institute	Evidence of UN-SDGs activities	Detailed Implementation Report; Schedule from Summer STEM Institute
	SF 1.8: Students develop projects that support attainment of the UN SDGs in their local communities.	% of students who developed projects to support attainment of UN SDGs in their local communities	% of students who developed projects to support attainment of UN SDGs	Detailed Implementation Report; Schedule from Summer STEM Institute; Roster of students with project status
	SF 1.9: Students are satisfied with the Summer Bridge experience.	% of students satisfied with Summer Bridge	% of students are satisfied with Summer Bridge	Detailed Implementation Report; Student feedback survey
SF 2: Appropriate math course placement	**SF 2.1:** Graduating high school seniors complete a mathematics assessment to determine their math skill level.	% of graduating high school seniors with mathematics assessment data	% of graduating high school seniors with mathematics assessment data	Detailed Implementation Report; De-identified student-level records of with assessment scores (e.g., mathematics portion of Florida's Postsecondary Education Readiness Test (P.E.R.T), ACT or SAT scores, institution-specific

				assessments for math course placement); overall enrollment numbers
	SF 2.2: Students meet with dedicated STEM advisor to discuss appropriate math course placement.	% of students meeting with STEM advisor to discuss math course placement.	% of students meeting with STEM advisor to discuss math course placement.	Detailed Implementation Report; Advising Log
	SF 2.3: Students can earn math course waivers after successful completion of math advising and the necessary standardized tests/assessments.	Evidence of math course waiver opportunity	Evidence of math course waiver opportunity	Detailed Implementation Report; Documentation (e.g., student information packet, roster of students who earned course waivers) of course waiver opportunity
		# of students who utilized math course waivers	# of students who utilized math course waivers	Detailed Implementation Report; Advising Log
Student Recruitment and Engagement				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF3: Student Recruitment and Focused Engagement	**SF 3.1**: Students participate in orientation (through summer STEM institute bridge program or dedicated orientation offered during the summer, fall, or spring).	% of LSAMP students who participate in orientation.	% of LSAMP students who participate in orientation.	Detailed Implementation Report; Student Activity Log
	SF 3.2: At least 90% of all LSAMP students belong to racially and ethnically minoritized groups.	% of LSAMP students who belong to racially and ethnically minoritized groups	90% of LSAMP students belong to racially and ethnically minoritized groups	Detailed Implementation Report; Strategic Indicators Report
	SF 3.3: Students meet with advisors at least 1 time per semester.	% students who meet with their advisor at least 1 time per semester	% students who meet with their advisor at least 1 time per semester	Detailed Implementation Report; Advising Log
	SF 3.4: Students participate in at least 3 LSAMP experiences per semester.	% students participating in at least 3 LSAMP experiences per semester	% students participating in at least 3 LSAMP experiences per semester	Detailed Implementation Report; Student Activity Log
Dedicated STEM Academic Advising				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF 4: Dedicated STEM Academic Advising	**SF 4.1:** Academic advisors engage LSAMP students in establishing educational plans and transfer plans.	% students who developed educational plans/transfer plans with their advisor.	% students who developed educational plans/transfer plans with their advisor.	Detailed Implementation Report; Advising Log
	SF 4.2: Academic advisors engage LSAMP students in identifying and preparing for CFSA engagement opportunities.	% students whose advisor discussed CFSA engagement opportunities in advising meetings.	% students whose advisor discussed CFSA engagement	Detailed Implementation Report; Advising Log

			opportunities in advising meetings.	
	SF 4.3: Academic advisors refer LSAMP students to other departments.	% students whose advisor referred them to other departments.	% students whose advisor referred them to other departments.	Detailed Implementation Report; Advising Log
	SF 4.4: Academic advisors respond to retention concerns.	% of students flagged at risk for retention who met with advisor over retention concerns.	% of students flagged at risk for retention who met with advisor over retention concerns.	Detailed Implementation Report; Advising Log
	SF 4.5: Students are satisfied with dedicated STEM academic advising.	% of students satisfied with STEM academic advising	% of students are satisfied with STEM academic advising	Detailed Implementation Report; Student Survey
Student-led STEM Skill Building and Peer Support				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF 5: Student-led STEM skill-building workshops and peer supports	**SF 5.1:** LSAMP students, including Peer Coaches and STEM club members, lead presentations and engagement opportunities for other LSAMP students and the broader STEM community.	# of presentations and engagement opportunities led by LSAMP students	# of presentations and engagement opportunities led by LSAMP students	Detailed Implementation Report; Engagement Opportunity Log
	SF 5.2: Peer Coaches and STEM club members facilitate informal support sessions for peers to connect and discuss achievements and challenges.	# of informal support sessions led by Peer Coaches and STEM club members	# of informal support sessions led by Peer Coaches and STEM club members	Detailed Implementation Report; Engagement Opportunity Log
	SF 5.3: STEM skill-building workshops and peer supports utilize technology to engage students across institutions.	Evidence of STEM-skill building workshops and peer support activities with hybrid/virtual formats	Evidence of STEM-skill building workshops and peer support activities with hybrid/virtual formats	Detailed Implementation Report; Engagement Opportunity Log
	SF 5.4: Students are satisfied with student-led STEM skill building workshops and peer supports.	% of students satisfied with student-led STEM skill building workshops and peer supports	% of students satisfied with student-led STEM skill building workshops and peer supports	Detailed Implementation Report; Event Feedback Forms
SF 6: Peer-led Supports	**SF 6.1:** Peer coaches facilitate study groups, activities, or mentor students in completion of research projects.	# of study groups led by Peer Coaches, # of students mentored by Peer Coaches	# of study groups led by Peer Coaches, # of students mentored by Peer Coaches	Detailed Implementation Report; Engagement Opportunity Log
	SF 6.2: Students lead activities (e.g., group study sessions, tutoring in STEM subjects, peer-led workshops)	# of activities led by students (e.g., group study sessions, tutoring in STEM subjects, peer-led workshops)	# of activities led by students (e.g., group study sessions, tutoring in STEM subjects, peer-led workshops)	Detailed Implementation Report; Engagement Opportunity Log

	SF 6.3: Students are satisfied with peer-led supports.	% of students satisfied with peer-led supports	% of students satisfied with peer-led supports	Detailed Implementation Report; Event Feedback Forms
STEM Identity, Professional Experiences, and Conferences				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF 7: STEM Identity	**SF 7.1:** On-campus and virtual workshops are offered to learn about STEM careers, enhance STEM identity, and expand STEM networks.	# of workshops offered to students on STEM careers, STEM identity, and STEM networking.	# of workshops offered to students on STEM careers, STEM identity, and STEM networking.	Detailed Implementation Report; Engagement Opportunity Log
	SF 7.2: Institutions promote STEM student community and support student interaction, workshops, and presentations by STEM professionals.	Evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	Evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	Detailed Implementation Report; Documentation of promotion (e.g., Newsletter)
	SF 7.3: Team members support students in competing for national research and internship opportunities.	# of students who are supported in competing for national research and internship opportunities.	# of students who are supported in competing for national research and internship opportunities.	Detailed Implementation Report; Advising Log; Student Survey
SF 8: STEM Conference	**SF 8.1:** STEM Summit, an alliance-wide conference, is held annually.	# of students who attend the annual STEM Summit.	# of students who attend the annual STEM Summit.	Detailed Implementation Report; Roster of STEM Summit attendees
		Evidence STEM Summit was held.	Evidence STEM Summit was held.	Detailed Implementation Report; Roster of STEM Summit attendees
	SF 8.2: LSAMP students attend national STEM conferences.	# of students who attend national STEM conferences.	# of students who attend national STEM conferences.	Detailed Implementation Report; List of students who attended or presented at STEM conferences.
	SF 8.3: LSAMP students encouraged and supported to submit applications to present research at national STEM conferences.	# of student meetings where students were encouraged to submit applications.	# of student meetings where students were encouraged to submit applications.	Detailed Implementation Report; Advising Log
		# of student research proposals submitted to national STEM conferences	# of student research proposals submitted to national STEM conferences	Detailed Implementation Report; List of students who attended or presented at STEM conferences.
SF 9: College and Industry Tours	**SF 9.1:** In-person and virtual lab tours are offered in STEM discipline areas at 4-year research institutions.	# of in-person and virtual lab tours offered	# of in-person and virtual lab tours offered	Detailed Implementation Report; List of college and industry tours
		# of students who attend in-person and virtual lab tours	# of students who attend in-person and virtual lab tours	Detailed Implementation Report; Rosters from in-person and virtual lab tours
	SF 9.2: In-person and virtual STEM tours are offered in STEM industry.	# of in-person and virtual STEM industry tours offered	# of in-person and virtual STEM industry tours offered	Detailed Implementation Report; List of college and industry tours

		# of students who attend in-person and virtual STEM industry tours	# of students who attend in-person and virtual STEM industry tours	Detailed Implementation Report; Rosters from in-person and virtual STEM industry tours
	SF 9.3: Students attend college tours at university partners' institutions.	# of college tours offered	# of college tours offered	Detailed Implementation Report; List of college and industry tours
		# of students who attend college tours	# of students who attend college tours	Detailed Implementation Report; Rosters from college tours
	SF 9.4: Students are satisfied with tours.	% of students satisfied with tours	% of students are satisfied with tours.	Detailed Implementation Report; Event Feedback Form
STEM Professionalization's Experiences through Paths to Engagement				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
SF 10: LSAMP Research Scholars	**SF 10.1:** LSAMP Research Scholars earn performance-based awards of $500 for semester-long experiences.	Students report financial benefits from award.		Detailed Implementation Report; Roster of LSAMP Research Scholars; Interview/focus group
	SF 10.2: LSAMP Research Scholars conduct research either on-campus or through external placements with industry or university partners.	% of LSAMP Research Scholars who conduct research	% of LSAMP Research Scholars who conduct research	Detailed Implementation Report; STEM Professionalization Experience Log
	SF 10.3: LSAMP Research Scholars engage in a minimum of 40 hours of undergraduate research, internships, or lab experiences.	% of LSAMP Research Scholars who engage in at least 40 hours of research	% of LSAMP Research Scholars who engage in at least 40 hours of research	Detailed Implementation Report; STEM Professionalization Experience Log
	SF 10.4: LSAMP Research Scholars present work at the LSAMP Showcase.	% of LSAMP Research Scholars who present work at the LSAMP showcase	% of LSAMP Research Scholars who present work at the LSAMP showcase	Detailed Implementation Report; STEM Professionalization Experience Log
SF 11: LSAMP Community Interns	**SF 11.1:** Community Interns earn awards of $500 upon successful completion of the program.	Students report financial benefits from award.		Detailed Implementation Report; Interview/focus group
	SF 11.2: Community Interns complete internships with community partners (a minimum of 25 hours).	% of Community Interns who engage in at least 25 hours of internship	% of Community Interns who engage in at least 25 hours of internship	Detailed Implementation Report; STEM Professionalization Experience Log
	SF 11.3: Community Interns present internship experiences as artifacts.	% of Community Interns who develop artifacts	% of Community Interns who develop artifacts	Detailed Implementation Report; STEM Professionalization Experience Log
SF 12: LSAMP Peer Coaches	**SF 12.1:** Peer Coaches lead/develop workshops and other opportunities for their peers.	% of Peer Coaches who lead/develop workshops and opportunities for peers	% of Peer Coaches who lead/develop workshops and opportunities for peers	Detailed Implementation Report; STEM Professionalization Experience Log
	SF 12.2: Peer Coaches earn awards of $500 upon successful completion of the program.	Students report financial benefits from award.		Detailed Implementation Report; Interview/focus group
	SF 12.3: Peer Coaches engage in a minimum of 40 hours of peer support.	% of Peer Coaches who engage in at least 40 hours of peer support	% of Peer Coaches who engage in at least 40 hours of peer support	Detailed Implementation Report; STEM Professionalization Experience Log

	SF 12.4: Peer Coaches create capstone presentations which are presented at the LSAMP Showcase.	% of Peer Coaches who create capstone presentations and present at the LSAMP showcase	% of Peer Coaches who create capstone presentations and present at the LSAMP showcase	Detailed Implementation Report; STEM Professionalization Experience Log

Figure 4: Faculty Focused Fidelity of Implementation Matrix

Diversity and Inclusion in STEM				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
FF 1: Faculty Development	**FF 1.1:** CFSA Paths offers workshops for faculty to support the engagement of URM students in STEM and undergraduate research.	# of workshops offered to faculty	# of workshops offered to faculty	Detailed Implementation Report; Agendas
		# of faculty who participate in workshops	# of faculty who participate in workshops	Detailed Implementation Report; Roster of attendees
Faculty and Staff Engagement				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
FF 2: Faculty involvement in co-curricular activities to build relationships and deepen student involvement	**FF 2.1:** Faculty serve as research mentors.	% of students assigned a research mentor	% of students assigned a research mentor	Detailed Implementation Report; Student Activity Log; Student Survey
		% of faculty serving as research mentors	% of faculty serving as research mentors	Detailed Implementation Report; Faculty participation log
	FF 2.2: Faculty participate in the Summer STEM Institute, STEM Clubs, conferences, field trips, and other activities.	% of faculty who participate in activities	% of faculty who participate in at least X activities	Detailed Implementation Report; Roster of faculty participation
FF 3: Faculty participation in CFSA work groups and implementation teams	**FF 3.1:** CFSA Faculty and Staff participate in CFSA working groups.	% of faculty who participate in CFSA working groups	% of faculty who participate in at least 1 CFSA working groups	Detailed Implementation Report; Faculty participation log
	FF 3.2: CFSA Faculty and Staff participate in institution-specific implementation teams.	% of faculty who participate in institution-specific implementation teams	% of faculty who participate in institution-specific implementation teams	Detailed Implementation Report; Faculty participation log
FF 4: Faculty Advocacy and Peer Community	**FF 4.1:** Faculty across institutions have opportunities to connect.	# of opportunities for faculty across opportunities to connect	# of opportunities for faculty across opportunities to connect	Detailed Implementation Report; List of opportunities for faculty across institutions to connect
		% of faculty who participate in cross-institution programming	% of faculty who participate in cross-institution programming	Detailed Implementation Report; Roster of attendees

Figure 5: Department/Institution Focused Fidelity of Implementation Matrix

Targeted STEM Pathways				
	Activity	**Indicator**	**Threshold**	**Instruments/Data Collection**
DIF 1: Develop and enhance STEM articulation and data sharing agreements	**DIF 1.1:** Articulation agreements are developed with expanded university partners.	# of articulation agreements developed with university partners	# of articulation agreements developed with university partners per year	Detailed Implementation Report; Copies of articulation agreements
	DIF 1.2: Articulate clear STEM degree pathways with university partners.	# of STEM degree pathways developed with university partners	# of STEM degree pathways developed with university partners	Detailed Implementation Report; Documentation of STEM degree pathways
	DIF 1.3: Develop data sharing agreements with university partners.	# of data sharing agreements developed with university partners	# of data sharing agreements developed with university partners per year	Detailed Implementation Report; Copies of data sharing agreements
DIF 2: Data Taskforce	**DIF 2.1:** Assessment and Evaluation group meets regularly.	# of Assessment and Evaluation group meetings	Assessment and Evaluation group meets # times per year	Detailed Implementation Report; Agendas and attendance sheets from assessment and evaluation meetings

Figure 6: Fidelity Index

Fidelity Index								
Indicator	**Indicator Source**	**Unit**	**Data Collection (Who, When)**	**Score for Levels of Implementation at the Unit Level**	**Threshold for Adequate Implementation at Institution Level**	**Roll-up to Alliance Level**	**Threshold for Fidelity**	**Expected Year of Fidelity Measurement**
At least 90% of all LSAMP students belong to racially and ethnically minoritized groups.	SF Fidelity 3.2	Student	PI provides LSAMP Enrollment on the Strategic Indicator Report once per year	0 (low)= X% of LSAMP student belong to URM group; 1 (medium)=X% of LSAMP student belong to URM group; 2 (high)=90% of LSAMP student belong to URM group	Adequate implementation at institution Level=score of "2"	1= 1 institution with score of "2"; 2= 2 institutions with score of "2"; 3=3 institutions with score of "2; 4=4 institutions with score of "2"	Threshold for fidelity= score of "3"	2022
Students meet with advisors at least 1 time per semester.	SF Fidelity 3.3	Student	PI provides advising records by student via the Advising Log once per semester. SEG compiles records by student per year.	0 (low)= X% of LSAMP students meeting with advisor once per semester; 1 (medium)=X% of LSAMP students meeting with advisor once per semester; 2 (high)=X% of LSAMP	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023

				students meeting with advisor once per semester				
Students participate in at least 3 LSAMP experiences per semester.	SF Fidelity 3.4	Student	PI provides activity records by student via the Student Activity Log once per semester. SEG compiles records by student per year.	0 (low)= X% of LSAMP students participating in at least 3 LSAMP experiences per semester; 1 (medium)=X% of LSAMP students participating in at least 3 LSAMP experiences per semester; 2 (high)=X% of LSAMP students participating in at least 3 LSAMP experiences per semester	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023
Students are satisfied with student-led STEM skill building workshops and peer supports.	SF Fidelity 5.4	Student	PI provides student with Event Feedback Form link after events. SEG downloads data from Qualtrics for fidelity analysis once per year. Calculate % of students who rated the overall event as a 4.0 or higher on question 9d to determine satisfaction.	0 (low)= 0-50% of responding students are satisfied ; 1 (medium)=51-69% of responding students are satisfied; 2 (medium-high)=70-80% of responding students are satisfied; 3 (high)= >81% of responding students are satisfied	Adequate implementation at institution Level=score of "2"	1= 1 institution with score of "2"; 2= 2 institutions with score of "2"; 3=3 institutions with score of "2; 4=4 institutions with score of "2"	Threshold for fidelity= score of "3"	2022
Students are satisfied with peer-led supports.	SF Fidelity 6.3	Student	PI provides student with Event Feedback Form link after events. SEG downloads data from Qualtrics for fidelity analysis once per year. Calculate % of students who rated the overall event as a 4.0 or higher on question	1 (low)= 0-50% of responding students are satisfied ; 1 (medium)=51-69% of responding students are satisfied; 2 (medium-high)=70-80% of responding students are satisfied; 3 (high)= >81% of responding students are satisfied	Adequate implementation at institution Level=score of "2"	1= 1 institution with score of "2"; 2= 2 institutions with score of "2"; 3=3 institutions with score of "2; 4=4 institutions with score of "2"	Threshold for fidelity= score of "3"	2022

			9d to determine satisfaction.					
Students are satisfied with tours.	SF Fidelity 9.4	Student	PI provides student with Event Feedback Form link after events. SEG downloads data from Qualtrics for fidelity analysis once per year. Calculate % of students who rated the overall event as a 4.0 or higher on question 9d to determine satisfaction.	1 (low)= 0-50% of responding students are satisfied ; 1 (medium)=51-69% of responding students are satisfied; 2 (medium-high)=70-80% of responding students are satisfied; 3 (high)= >81% of responding students are satisfied	Adequate implementation at institution Level=score of "2"	1= 1 institution with score of "2"; 2= 2 institutions with score of "2"; 3=3 institutions with score of "2; 4=4 institutions with score of "2"	Threshold for fidelity= score of "3"	2022
LSAMP Research Scholars engage in a minimum of 40 hours of undergraduate research, internships, or lab experiences.	SF Fidelity 10.3	Student	PI provides participation records through STEM Professionalization Experiences Log	0 (low)= X% of LSAMP Research Scholars engaging in at least 40 hours of related activities; 1 (medium)=X% of LSAMP Research Scholars engaging in at least 40 hours of related activities; 2 (high)=X% of LSAMP Research Scholars engaging in at least 40 hours of related activities	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023
Community Interns complete internships with community partners (a minimum of 25 hours).	SF Fidelity 11.2	Student	PI provides participation records through STEM Professionalization Experiences Log	0 (low)= X% of LSAMP Community Interns engaging in at least 25 hours of related activities; 1 (medium)=X% of LSAMP Community Interns engaging in at least 25 hours of related activities; 2 (high)=X% of LSAMP Community Interns engaging in at least 25 hours of related activities	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023
Peer Coaches engage in a minimum of	SF Fidelity 12.3	Student	PI provides participation records through STEM	0 (low)= X% of LSAMP Peer Coaches engaging in at least 40 hours of related activities; 1 (medium)=X% of LSAMP	Adequate implementation at institution	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3	Threshold for fidelity= score of "X"	2023

40 hours of peer support.			Professionalization Experiences Log	Peer Coaches engaging in at least 40 hours of related activities; 2 (high)=X% of LSAMP Peer Coaches engaging in at least 40 hours of related activities	Level=score of "X"	institutions with score of "X; 4=4 institutions with score of "X"		
CFSA Paths offers workshops for faculty to support the engagement of URM students in STEM and undergraduate research.	FF Fidelity 1.1	Faculty/Staff	PI provides list of opportunities offered to faculty/staff.	0 (low)= X workshops offered to faculty/staff; 1 (medium)=X workshops offered to faculty/staff; 2 (high)=X workshops offered to faculty/staff	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023
Faculty/staff participate in the Summer STEM Institute, STEM Clubs, conferences, field trips, and other activities.	FF Fidelity 2.2	Faculty/Staff	PI provides list of faculty/staff members and rosters of faculty/staff participation in activities. SEG compiles information to determine how many activities each faculty/staff member participated in. SEG detemines how many faculty/staff members meet the threshold of participating in at least X activities.	0 (low)= X% of faculty/staff engaging in at least X activities; 1 (medium)=X% of faculty/staff engaging in at least X activities; 2 (high)=X% of faculty/staff engaging in at least X activities	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4 institutions with score of "X"	Threshold for fidelity= score of "X"	2023
Develop and enhance STEM articulation and data	DIF Fidelity 1.1-1.3	Agreements	PI provides information on specific agreements established in	0 (low)= X agreements established; 1 (medium)=X agreements established; 2 (high)=X agreements established	Adequate implementation at institution Level=score of "X"	1= 1 institution with score of "X"; 2= 2 institutions with score of "X"; 3=3 institutions with score of "X; 4=4	Threshold for fidelity= score of "X"	2023

sharing agreements			annual Project Staff Interview.			institutions with score of "X"		

In addition to the fidelity of implementation matrices, a process-monitoring matrix was developed. The purpose of process monitoring is to provide information to CFSA institutions to inform improvements to program implementation. It uses a mixed methods approach to collect information that identifies barriers or challenges that have impacted implementation, track improvement in service delivery, and assess the overall reach of the services provided. It also identifies actions taken by project staff to ensure the sustainability of strategies/activities beyond the grant funding period. The process monitoring matrix can be found in figure 7.

Figure 7: Process Monitoring Matrix

Process Monitoring		
Process Monitoring Question	**Instruments/Data Collection**	**Frequency**
1. What successes has the project achieved? Which component of the project is considered to be most closely associated with this success?	Administrator, faculty and student focus groups and interviews; Annual Student Survey	Spring Term (1x/year)
2. What challenges has the project faced and what actions were taken in response? Which component of the project is considered to be most closely associated with this challenge?	Administrator, faculty and student focus groups and interviews; Annual Student Survey	Spring Term (1x/year)
3. What factors (internal or external) have affected project implementation? What were the impacts of these factors on implementation?	Administrator, faculty and student focus groups and interviews; Annual Student Survey	Spring Term (1x/year)
4. What steps have been taken by the institutions that demonstrate a commitment to sustainability or institutionalization of grant-funded personnel, programs, and services?	Administrator, faculty and student focus groups and interviews; Annual Student Survey	Spring Term (1x/year)
5. How has this project affected the colleges overall?	Administrator, faculty and student focus groups and interviews; Annual Student Survey	Spring Term (1x/year)
6. What suggestions for program improvement are offered by students, staff, and faculty?	Feedback forms administered to students and faculty after events	After events (multiple/year)

Outcome Evaluation

The outcome evaluation will utilize both quantitative and qualitative data to identify student, faculty, and institutional impacts from the CFSA project. Strategic indicators for the outcome evaluation are presented in the following section and broken out by goal. Outcomes will be reported at the Alliance and campus levels. Guiding evaluation questions for assessing CFSA project outcomes are:

To what extent were the intended outcomes realized at the Alliance and individual campus levels?

What was the relationship of fidelity of implementation to mid- and long-term student outcomes including graduation rates, retention, sense of belonging, application and transfer rates, and STEM self-efficacy and identity (including after transfer)?

Were there any unintended outcomes associated with the CFSA project?

Strategic Indicators

The outcome evaluation utilizes several strategic indicators (Figure 8). In the following sections, strategic indicators are separated by goal.

Figure 8: Strategic Indicators

Strategic Indicators						
Strategic Indicator (Outcome)	**Metrics and Definitions**	**Baseline**	**Target**	**Data Source**	**Disaggregation**	**Data Collection**
SI.1 Increase in LSAMP URMs declaring STEM major (1.2)	Degree seeking status; education plan designation	Numbers: Spring 2019, Fall 2019		Edu. Plan designation; CFSA IR Offices	By CFSA institution, gender, major, race, participation level in LSAMP	Fall & Spring, end of semester
SI.2 Increase in LSAMP URM students maintain GPA of 2.75 or higher (1.2)	Cumulative GPA	Percent with 2.75 Spring 2019 and Fall 2019		CFSA IR Offices	By CFSA institution, gender, major, race, participation level in LSAMP	Fall & Spring, end of semester
SI.3 Increased retention & persistence rates compared to prior grant years & non LSAMP URM STEM students (1.1, 1.2, 1.4)	Degree seeking status, education plan designation, semester to semester, after core courses completed	5 year trend 2014-2019		CFSA IR Offices	By CFSA institution, gender, major, race, participation level in LSAMP	Fall & Spring, beginning of semester
SI.4 Increased participation rate in CFSA activities for students (1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3)	Rates by semester with total for the year; presentations, college visits, tutoring, advising, workshops, industry tours	Participation rates for prior grants by semester & year	Students will participate in 176 experiences as Community Interns, Research Scholars, and/or Peer Coaches	STEM Professionalization Log	By CFSA institution, gender, major, race	Collect each semester; report each Spring
			At least 24 non-LSAMP URM students participate in 30 hour of activities promoting ongoing success in STEM	Student Activity Log; LSAMP participation records; Event Feedback Form	By CFSA institution, gender, major, race	Collect each semester; report each Spring
SI.5 Social justice STEM opportunities increase student interest and motivation in STEM (2.2)	% participation rates by year; motivation rates based on Motivational Scale	motivation levels at start of STEM classes, Orientations, Summer Bridge		LSAMP student survey (Program Feedback 6c); LSAMP participation records; Student Survey(Pre Program Survey (7, 11-15); Post Program Survey Part 2 (3-5)	By CFSA institution, gender, major, race; participation rates	Participation rates each semester, motivation rates each year

SI.6 Increase in LSAMP URM student graduation rates (1.2, 1.3, 1.4, 2.3)	5 year graduation rate; Associate's Degree; fall graduation to summer per year	5 year trend 2014-2019		CFSA IR Offices; exit interview	By CFSA institution, gender, major, race; participation rates	Annual, Fall for prior year; exit interview semester of graduation; post grad survey 1 yr after
SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4 year baccalaureate program (1.4)	Number of applicants and number of transfers any graduation year under the grant	5 year trend 2014-2019	30% net increase over the baseline number of successful URM transfers into university bachelor's degree STEM majors	CFSA IR Office; partner universities; exit interviews	By CFSA institution, gender, major, race, participation level in LSAMP	Annual, Fall for prior year
SI.8 LSAMP URM students feel they belong in STEM at their institution (1.1)	Student survey administered by external evaluator (i.e., , Science Identity Scale and Identity as a Scientist Scale, Impact of Background on Science Experience); correlations with engagement levels (i.e., student activity log, STEM professionalization log, advising log)	Baseline score taken prior to start of classes; orientation & Summer Bridge		Student survey administered by external evaluator (Specifically, Science Identity Scale and Identity as a Scientist Scale, Impact of Background on Science Experience, Program Feedback 9a-c); Student Focus Group (19)	By CFSA institution, gender, major, race, participation level in LSAMP	At completion of core courses and prior to graduation
SI.9 Increase in STEM self-efficacy and identity for LSAMP URM students (1.2, 1.3)	STEM self-efficacy and identity scales, correlations with engagement levels (i.e., student activity log, STEM professionalization log, advising log)	Baseline score taken prior to start of classes; orientation & Summer Bridge		Student survey administered by external evaluator (Specifically, STEM Self-Efficacy Scales, Confidence as a Scientist Scale, Identity as a Scientist Scale, Commitment to Science. Program Feedback 9g); Student Focus Group (19)	By CFSA institution, gender, major, race, participation level in LSAMP	At completion of core courses & 2 major HIP activities prior to graduation
SI.10 STEM self-efficacy and identity maintained after transfer to 4 year baccalaureate program (2.1, 2.2, 2.3)	STEM self-efficacy and identity scales, correlations with engagement levels (i.e., student activity	Score at graduation	1 year after transfer STEM self-efficacy score is maintained or higher	Alumni survey administered by external evaluator (Specifically, STEM Self-Efficacy Scales,	By CFSA institution, gender, major, race, participation level in LSAMP	At completion of 2 semesters or coursework after transfer

	log, STEM professionalization log, advising log)			Confidence as a Scientist Scale, Identity as a Scientist Scale, Commitment to Science; Program Feedback 9g); Student Focus Group (19)		

Goal 1 Strategic Indicators

Goal 1 aims to ensure LSAMP, underrepresented minority, STEM students are better prepared to succeed in STEM baccalaureate programs. Goal 1 is measured by 9 strategic indicators.

SI.1 Increase in LSAMP URMs declaring a STEM Major

For SI.1, degree seeking status and education plan designation will be collected from CFSA IR offices. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Baseline data will be established in Spring and Fall 2019. Data will be compared to the baseline to determine if an increase occurred. Supplemental information will be collected from student interviews and focus groups.

Definitions

Degree seeking status: Students enrolled who have indicated, either via application for admission or through an update to their official records, they are seeking a degree at the institution.

Education plan designation: The degree specified on a student's education plan.

Underrepresented Minority (URM): African Americans, Hispanic Americans, American Indians or Alaska Natives, Native Hawaiians or Other Pacific Islanders.

STEM Major: A major in the STEM field (Science, Technology, Engineering, and Math. A full list of recognized STEM Majors by institution is included in Appendix C.

SI.2 Increase in LSAMP URMs who maintain a GPA of 2.75 or higher

For SI.2, cumulative GPA will be collected from campus IR offices. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Baseline data will be established in Spring and Fall 2019. Data will be compared to the baseline to determine if an increase in occurred.

Definitions

Cumulative GPA: Grade point average calculated from all course work at the institution.

Participation Level in LSAMP: Determined through several participation opportunities: STEM advising, STEM professionalization experiences (i.e., Research Scholars, Community Interns, Peer Coaches), and participation in LSAMP activities (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities).

SI.3 Increased retention and persistence rates compared to prior grant years and non-LSAMP URM STEM students

For SI.3, degree seeking status and education plan designation will be collected from college IR offices. These data will be obtained at the end of each semester after core courses are completed. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Baseline data will be the 5-year trend in retention and persistence rates from 2014-2019. Data will be compared to the baseline to determine if an increase in occurred. Supplemental information will be collected from student interviews and focus groups.

Definitions

Retention rate: The percentage of first-time students who return to the same institution the following fall.

Persistence rate: The percentage of students who continue enrollment at any institution the following fall.

SI.4 Increased participation rate in CFSA activities for students

For SI.4, participation rates will be collected from CFSA IR offices. These data will be obtained at the end of each semester and totaled for the year. This indicator includes two targets:

1. Students will participate in 176 experiences as Community Interns, Research Scholars, and/or Peer Coaches

2. At least 24 additional URM students participate in 30 hours of activities promoting ongoing success in STEM

Activities include presentations, college visits, industry tours, tutoring, advising, and workshops. Data will be disaggregated by CFSA institution, gender, major, and race. Baseline data will be participation rates from prior grants by semester and year. Data will be compared to the baseline to determine if an increase in occurred.

SI.5 Social justice STEM opportunities increase student interest and motivation in STEM

For SI.5, participation rates in social justice STEM opportunities will be collected from CFSA IR offices and an existing motivation scale will be administered. The STEM Perseverance and motivation scale will be administered yearly and the baseline data for this scale will be obtained prior to orientation, Summer Bridge, and the start of classes. Social justice STEM participation rate data will be obtained each year. Data will be disaggregated by CFSA institution, gender, major, race, and participation rates. Data will be compared to the baseline to determine if an increase in occurred. Further, statistical tests will determine if there were correlations between scale score and participation rates.

Definitions

Social justice STEM opportunities: Social justice STEM is an approach to STEM learning driven by social justice inquiry and action.**5** Activities may include development of projects using the UN Sustainable Development goals, participation as community interns, and researching a social justice issue connected to STEM. A definition of social justice STEM opportunities will be developed with the Evaluation Liaisons from each campus in Quarter 1 of Year 2. .

STEM Perseverance and Motivation scale: A pre-existing STEM perseverance and motivation scale from Syed et al. (2018) was selected for use.

Social justice STEM participation rate: Determined through participation in social justice STEM opportunities (see above).

SI.6 Increase in LSAMP URM student graduation rates

For SI.6, graduation rates for Associate's degrees will be collected from CFSA IR offices. These data will be obtained for each graduation (Fall to summer). Data will be disaggregated by CFSA institution, gender, major, race, and participation rates. Baseline data will be the 5-year trend in graduation rates from 2014-2019. Data will be compared to the baseline to determine if an increase in occurred.

Definitions

Graduation rate: The percentage of students who earn an Associate's degree within 6 years.

SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4-year baccalaureate programs

For SI.7, transfer application information and transfer rates to STEM majors will be collected from CFSA IR offices. These data will be obtained yearly. Data will be disaggregated by CFSA institution, gender, major,

5 Madden et al., 2017.

race, and participation level in LSAMP. Baseline data will be the 5-year trend in transfer applications and transfer rates from 2014-2019. Data will be compared to the baseline to determine if an increase in occurred. Supplemental information will be collected from exit interviews and post-graduation surveys.

Definitions

Transfer application: Students who report they submitted an application to transfer to another institution.

Transfer rate: Percent of students who transfer to another institution and enroll in a STEM major.

SI.8 LSAMP URM students feel they belong in STEM at their institution

For SI.8, sense of belonging will be measured using selected scales (Byars-Winston et al., 2016, Science Identity Scale; Syed et al., 2018 Identity as a Scientist Scale, Impact of Background on Science Experience). These data will be obtained several times: 1) prior to orientation, Summer Bridge, and the start of classes 2) annually during program participation, and 3) prior to graduation. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Baseline data will be the initial scale score prior to orientation, Summer Bridge, and the start of classes. Data will be compared to the baseline to determine if an increase in occurred. Further, statistical tests will determine if there was a correlation between scale score and engagement level. Supplemental information will be collected from student interviews and focus groups.

Definitions

Sense of belonging: Student's identification with an academic setting.**6**

SI.9 Increase in STEM self-efficacy and identity for LSAMP URM students

For SI.9, STEM self-efficacy and STEM identity will be measured using existing scales(Byars-Winston et al, 2016, STEM Self-Efficacy Scales; Syed et al., Confidence as a Scientist. Identity as a Scientist, Commitment to Science). These data will be obtained several times: 1) prior to orientation, Summer Bridge, and the start of classes 2) annually during program participation, and 3) prior to graduation. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Baseline data will be the initial scale scores prior to orientation, Summer Bridge, and the start of classes. Data will be compared to the baseline to determine if increases occurred. Further, statistical tests will determine if there were correlations between scale scores and engagement level. Supplemental information will be collected from student interviews and focus groups.

Definitions

STEM self-efficacy: When students view themselves as competent in STEM, expect positive outcomes, have an interest that fosters educational and occupational goals, and receive performance feedback that supports their choices.**7**

STEM identity: When students "feel like a scientist". The dimensions of STEM identity are competence in their STEM subject, their performance and skills as a scientist, their opportunities to use their science skills, recognition by others they are a scientist, and a student's ability to integrate their science identity with other social identities such as race, gender, and class.**8**

High-impact practice (HIP) activities: High-impact practices are teaching and learning practices that have been widely tested and have been shown to be beneficial for college students from many backgrounds, especially historically underserved students, who often do not have equitable access to high-impact learning. These practices can assume many different forms, depending on learner characteristics and on

6 Byars-Winston et al., 2016
7 Byars-Winston et al., 2016
8 Byars-Winston et al., 2016

institutional priorities and contexts.**9** A definition of high-impact practice activities in the CFSA will be developed with the Evaluation Liaisons from each campus in Quarter 1 of Year 2.

Goal 2 Strategic Indicators

Goal 2 aims to increase the number of underrepresented minority students who successfully transfer into STEM baccalaureate programs. Goal 2 is measured by 3 strategic indicators.

SI.4 Increased participation rate in CFSA activities for students

SI.4 spans goal 1 and 2. For more information on how this strategic indicator will be measured, please see the goal 1 section.

SI.6 Increase in LSAMP URM student graduation rates

SI.6 spans goal 1 and 2. For more information on how this strategic indicator will be measured, please see the goal 1 section.

SI.10 STEM self-efficacy and identity maintained after transfer to 4-year baccalaureate program

For SI.10, STEM self-efficacy and STEM identity will be measured using existing scales (Byars-Winston et al, 2016, STEM Self-Efficacy Scales; Syed et al., Confidence as a Scientist. Identity as a Scientist, Commitment to Science).. These data will be obtained twice while students are at the CFSA institution and after completion of two semesters of coursework after the student has transferred. For this strategic indicator, the baseline data will be scale scores prior to graduation. Data will be disaggregated by CFSA institution, gender, major, race, and participation level in LSAMP. Data will be compared to the baseline to determine if one year after transfer the STEM self-efficacy and identity scores are maintained or higher. Further, statistical tests will determine if there were correlations between scale scores and engagement level. Supplemental information will be collected from student interviews, focus groups, and surveys.

9 https://www.aacu.org/resources/high-impact-practices

Supplemental Indicators

The evaluation also utilizes several supplemental indicators (Figure 9).

Figure 9: Supplemental Indicators

Supplemental Indicators			
Supplemental Question	**Instruments/Data Collection**	**Associated Survey Questions**	**Associated Focus Group Questions**
1. To what degree did student participation in each component of the LSAMP program lead to outcomes? Did students realize the outcomes? Do students believe participation in components of the LSAMP program were important contributors to the outcomes?	See Below	See Below	See Below
1a. STEM Professionalization Experiences	Student Focus Group, Student Survey	Research Scholar: Program Feedback (4a-b); Community Intern (6a-c); Peer Coach (8a)	Student Focus Group (13a-b, 13d, 14a-b,14d,15a-b,15d)
1b. Mentoring and Relationships with faculty, staff, advisors, and peers	Student Survey	Program Feedback (2b (i-vii); 9e-9f); Post-Program Scale (3a-q); Pre-Program Scale (4a-q)	Student Focus Group (10a)
1c. Summer Bridge	Student Focus Group		Student Focus Group (12)
1d. Student-led STEM skill-building workshops and peer supports	Student Focus Group		Student Focus Group (4)
1e. STEM Identity, Professional Experiences, and Conferences	Student Focus Group		Student Focus Group (4, 18-19)
2. How does participation in the LSAMP program affect students' future career plans?	Student Survey	Pre-Program Scale (8-15); Post-Program Scale (4-5); Program Feedback (9i); Student Focus Group (4)	Student Exit Interview (4-5); Faculty Focus Group (2, 5b)

Quasi-Experimental Design

Design

An outcome study will be conducted in the final year of the project. This outcome study will utilize a quasi-experimental design (QED) to establish a cause-and-effect relationship between engagement with the LSAMP program and several indicators:

- SI.2 Increase in LSAMP URMs who maintain a GPA of 2.75 or higher;
- SI.3 Increased retention and persistence rates compared to prior grant years and non-LSAMP URM STEM students;
- SI.6 Increase in LSAMP URM student graduation rates;
- SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4 year baccalaureate programs.

The design is a non-equivalent groups design. In a nonequivalent groups design, it is expected that groups are not similar as they have not been randomly assigned but are being determined based on participation levels in LSAMP.

Groups will be determined based on engagement with the LSAMP program. Exploratory analysis will be conducted after Year 1 to refine to determine if grouping criteria for LSAMP activity participation is appropriate or if it needs to be modified. Three groups will be formed:

- Low Engagement: Students who complete the minimum requirements to remain an LSAMP member. Specifically:
    - Participation in 3 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) per semester; and
    - Meets with STEM advisor 1 time per semester.
- Medium Engagement: Students who demonstrate additional engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or more frequent participation in LSAMP experiences. Specifically:
    - Participation in 4-7 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and
    - Meets with STEM advisor 1 or more times per semester.
- High Engagement: Students who demonstrate significant engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or very frequent participation in LSAMP experiences. Specifically:
    - Participation in 8 or more LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and
    - Meets with STEM advisor 1 or more times per semester.

Data Collection

Several data points will need to be collected to conduct the QED. The following section details the data collection procedures for each data point:

- **Student Participation in LSAMP Experiences:** Project Leads will collect this data through the Student Activity Log. This log collects data on student participation in Summer Bridge, orientation, and other LSAMP activities. The log is submitted to SEG once per term (i.e., Fall, Spring, Summer).

- **Student Participation in LSAMP Programs (i.e., Research Scholar, Community Intern, Peer Coach):** Project Leads will collect this data through the STEM Professionalization Experience Log. This log collects data on student participation LSMAP programs. The log is submitted to SEG once per term (i.e., Fall, Spring, Summer).

- **Student Participation in Advising:** Project Leads or advisors will collect this data through the Advising Log. This log collects data on student participation in advising. The log is submitted to SEG once per term (i.e., Fall, Spring, Summer).

- **GPA:** Project Leads will contact the Institutional Research office to obtain cumulative GPA. Cumulative GPA will be submitted at the end of the semester each fall and spring.

- **Degree Seeking Status:** Project Leads will contact the Institutional Research office to obtain degree seeking status for all LSAMP students. Cumulative GPA will be submitted at the beginning of the semester each fall and spring.

- **Education Plan Designation:** Project Leads will contact the Institutional Research office to obtain education plan designation for all LSAMP students. Education plan designation will be submitted at the beginning of the semester each fall and spring.

- **Graduation Records:** Project Leads will contact the Institutional Research office to obtain graduation records (including enrollment date) for all LSAMP students. Graduation records will be submitted annually in the fall for the prior year.

- **Transfer Records:** Project Leads will obtain transfer records (i.e., applications, transfers) for LSAMP students. Transfer records will be submitted annually in the fall for the prior year.

Data Analysis

Groups (i.e., low engagement, medium engagement, high engagement) will be established each semester using the criterion above. Then, analyses will be conducted for each of the selected strategic indicators to determine if the indicators are related to engagement.

Regression will be used to determine the relationship between each of the variables (i.e., GPA, retention, persistence, graduation, transfer rates, and transfer application rates). A regression analysis will be conducted for each variable (i.e., GPA, retention, persistence, graduation, transfer rates, and transfer application rates).

STUDY PARTICIPANTS & CONSENT

The primary participants in the evaluation will be students, faculty, and staff. Consent will be obtained according to Valencia College's Institutional Review Board protocols. Please see the IRB application in Appendix D for full detail on consent practices.

Participant Sampling

Surveys: All participating students, faculty, and staff will be invited by CFSA institution leads to participate in the surveys. Event feedback forms will be sent to event attendees by CFSA institution project leads based on the attendance rosters. A raffle for student participation will be offered.

Focus Groups: Focus groups will be conducted with participating students, faculty, and staff. For each population, participants and alternates will be selected using a stratified sample from the full population based on their gender, major/department, and level of participation. A stipend will be provided for student participation.

STUDY TASKS

Working closely with the project director and the CFSA evaluation team, SEG will perform the following tasks in for the evaluation. A full workplan is included in Appendix B.

TASK 1: Post-Award Kick-off Meeting (First Project Year Only)

SEG participated in a kick-off meeting with project staff across institutions. The overall meeting provided a project overview, time to discuss updates to the LSAMP award program, collaboration within and across institutions to establish roles on cross-institution teams, and an overview of the evaluation plan.

The specific objectives of the evaluation portion of the kick-off meeting were to:

- Introduce the evaluation team;
- Provide an overview of the logic model and theory of change;
- Describe the evaluation design;
- Discuss the strategic indicators;
- Introduce campus data collection and documentation responsibilities; and
- Provide an overview of the key evaluation deliverables.

TASK 2: Finalize Evaluation Plan

A final, detailed evaluation plan was developed after the Post-Award Phase kickoff meeting and in consultation with Alliance partners. This plan serves as a detailed guide for implementation of the evaluation. The plan includes sections on:

- Purpose of study and project background;
- Project goals and objectives, theory of change, and logic model;
- Evaluation design, including fidelity matrices and summative outcomes and indicators;
- Description of the specific project activities that are the focus of the evaluation study;

    - Data collection methods and instruments.
    - Plan for identifying a control group.
    - Data collection guide.
    - Plan for collecting required student data from Institutional Research offices or program staff, including a control group.
    - Plan for collecting and reporting program implementation data to support project managers and PIs in making decisions.
- Plan for establishing data sharing among partners;
- Data analysis methods appropriate to responding to the evaluation questions;
- Data collection schedule and updated work plan;
- Data management plan;
- Approach to informed consent/protection of human subjects; and
- Reporting plan.

The IRB package was developed following approval of the evaluation plan.

Each year, SEG will review the evaluation plan with the client and facilitate discussions with project stakeholders to ensure the plan is consistent with program implementation and producing credible findings that support intended use.

TASK 3: Develop and Test Data Collection Instruments and Protocols (First Project Year Only)

SEG will develop a data collection guide for distribution at the first Quarterly Alliance Meeting. The guide will include sections on each data collection instrument, how each instrument is used, and who is responsible. The data collection guide is available in Appendix F.

In partnership with the project director and evaluation liaisons, SEG will develop the remaining data collection instruments (e.g., surveys) and select appropriate scales to measure STEM sense of belonging and STEM self-efficacy and identity.

TASK 4: Collect Data

Following the approval of the evaluation plan, identification of a control group, and testing and refinement of data collection instruments, SEG will proceed with data collection across all project years.

SEG will use electronic means for some data collections. Microsoft Teams will be used for virtual focus groups and interviews. Survey data will be collected with either SurveyMonkey or Qualtrics.

In addition to online data collection, we will convene meetings, interviews, and a student focus group at least once a year for each campus to interview the grant team, students, and other stakeholders for

evaluation purposes. A virtual site visit will occur in January of Year 1. Year 2 and 3 will include an in-person site visit in January of each year.

Year 1 Virtual Proposed Site Visit Schedule		
Day	College	Data Collection
Day 1	College of Central Florida	• Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 2	Pasco-Hernando State College	• Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 3	Valencia College	• Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 4	Polk State College	• Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Year 2 and 3 Proposed Site Visit Schedule		
Day	College	Data Collection
Day 1 AM	College of Central Florida	• Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 1 PM	Pasco-Hernando State College	• Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 2 AM	Valencia College	• Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 2 PM	Polk State College	• Grant Team Interview • Student Focus Group • Faculty Focus Group

Note: Observations and other data collection activities will be added as time allows

TASK 5: Data Analysis and Interpretation of Findings

Annually, qualitative data will be loaded into a qualitative data analysis software. Analysis will be conducted using grounded theory methodology and three-level coding. Survey data analysis will use frequencies and mean, and advanced statistical analysis depending on the questions to be answered and the type of evaluation design conducted. STEM self-efficacy measures and other time series measures will follow analysis recommended by the original instrument designers.

As data are collected and analyzed, and preliminary findings emerge, SEG will present the data to the primary intended users during “sense making” sessions. These sessions will take place at in the spring of each year to support program management. They are facilitated discussions to contextualize findings and discuss the usefulness of findings. In addition to making findings immediately available to primary evaluation users, input from users is critical to helping the evaluation shape the interpretation of findings and program recommendations.

In Year 1, the sensemaking session will also include an initial discussion of threshold levels based on first year findings.

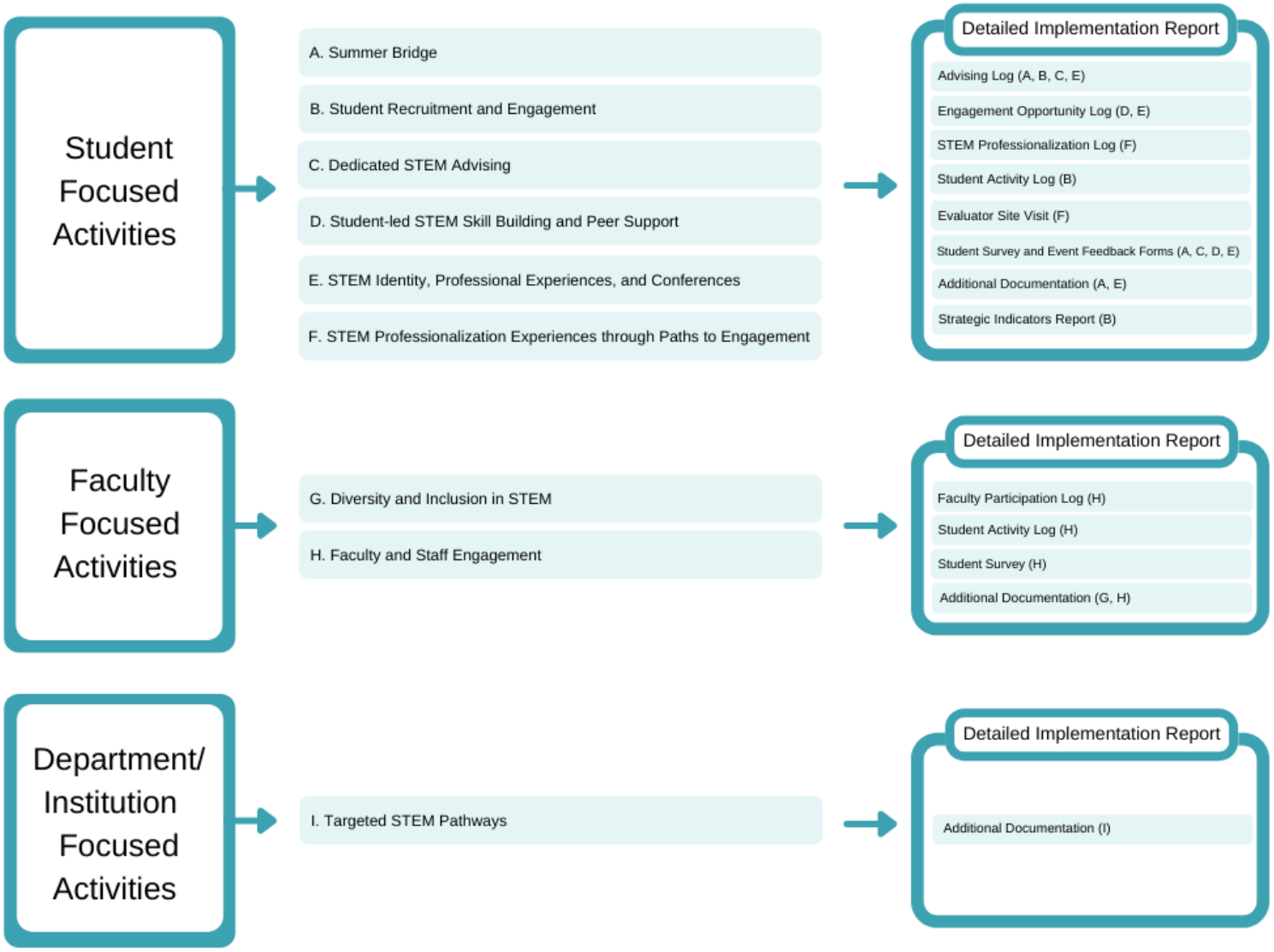
TASK 6: Communication and Reporting

Evaluation results must be accurately communicated in a timely manner to help clients make informed decisions that ultimately will improve their programs and identify program impact. SEG will prepare an annual report in Year 1 and engage in an end of year briefing at the June Quarterly Alliance Meeting. Starting in Year 2, the reporting schedule will include a mid-year and end of year briefing. A final evaluation report will be developed in Year 3.

DATA COLLECTION

This evaluation uses a mixed methods approach and will produce data that is both qualitative and quantitative in nature. Mixed methods increase the validity of studies, allow for triangulation strategies, and provide a more complete answer to evaluation questions. The evaluation framework, strategic indicators, fidelity of implementation matrices, and process monitoring matrices provide information about how data on indicators will be collected. As indicators in these documents span several program activities and data types, several tools have been developed to streamline data collection. Figure 9 details how activities are linked to data collection tools.

Figure 9: Data Collection



The following section details the data collection tools and how they are used.

- Detailed Implementation Report: The detailed implementation report will be filled out by Project Leads and verified by SEG. This report aligned with the fidelity matrices, each indicator is accompanied by a question on the detailed implementation report. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. An extra column is provided for liaisons to include if they will be providing additional data sources. This form is filled out once per term (i.e., Fall, Spring, Summer).

- Strategic Indicators Report: The strategic indicators report will be filled out by Project Leads and verified by SEG. This report is aligned with the strategic indicators. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. This form is filled out once per year (i.e., the end of the Summer term).

- Advising Log: The advising log will be filled out by advisors and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Advisors report on advising activities (e.g., meeting dates, topics) by student. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Engagement Opportunity Log: The Engagement Opportunity Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on engagement opportunities offered to LSAMP Students including date, leader, role of leader, modality, number of attendees, and if an attendee roster will be provided. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Faculty Log: The faculty log will be filled out by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project Leads list all possible faculty participants and record faculty participation in activities (i.e., research mentor, working group, implementation team). Faculty name can be replaced with a unique identifier. This form is updated and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- STEM Professionalization Log: The STEM Professionalization Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on STEM professionalization participation (i.e., research scholar, community intern, peer coach). This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Student Activity Log: The Student Activity Log will be filled out by project staff and verified by the Project lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on student participation in Summer Bridge, orientation, and This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

DATA MANAGEMENT & ANALYSIS

Data Analysis

The evaluation will use a mixed-methods design to utilize both quantitative and qualitative data to identify student, faculty, and institutional impacts from the CFSA program. The evaluation consists of two parts, a process evaluation and an outcome/effectiveness evaluation. The process evaluation includes four matrices; the fidelity of implementation indicators are presented on pp. 13-19 and the process monitoring questions are presented on p. 20. The strategic indicators for the outcome evaluation are presented on pp. 21-22. Data will be reported at the Alliance and campus levels.

Quantitative data generated will be summarized using methods outlined in the Evaluation Framework (see above). Qualitative data will be analyzed using grounded theory with two-level coding. The final coding will be focused and patterned coding. Code books and indices will be created for both types of data.

Preliminary findings will be shared with the Project Director and Evaluation Liaisons in advance of the report. SEG will present findings to the Project Director and Evaluation Liaisons during a “sense making” session, during which facilitated discussions will help to contextualize findings and identify how to apply findings to improve program implementation. In addition to making findings immediately available to primary evaluation users, input from users is critical to helping the evaluation team shape the interpretation of findings and program recommendations.

Data Management

Documents and other data collected and submitted to SEG will be kept on a secure online platform. Computers are password protected. All student, faculty, and staff data will be stripped of identifiers. The full data management plan is available in Appendix E.

REPORTING

The final report will be presented in draft form to the Project Director for review, then feedback will be incorporated into the final version of the report. The final report will be submitted in PDF format to project staff and will contain the following sections:

- Summary of findings and recommendations
- Program description
- Findings
- Conclusions and recommendations
- Evaluation design and methodology
- Appendices, including copies of the data collection instruments and list of anonymized raw data from interviews and survey

APPENDIX A: PROPOSED WORK PLAN

The work plan for key study administration and data collection and analysis activities is presented in the tables below.

Table 1: Year 1 Work Plan

1. Kick-off meeting	**07/19/2021**
2. Finalize evaluation plan	**12/15/2021**
a. Develop draft evaluation plan; present to project director	9/10/2021
b. Modify draft evaluation plan; present plan overview and data collection guide at Quarterly Alliance Meeting	9/17/2021
c. Finalize evaluation plan	10/19/2021
d. Develop IRB package	11/16/2021
3. Develop and test data collection instruments and protocols	**11/30/2021**
a. Draft institutional data collection forms (e.g., strategic indicators report, detailed implementation report)	9/17/2021
b. Draft student and post-graduate survey instruments	11/5/2021
c. Draft administrator, student, and faculty interview and focus group protocols	11/5/2021
d. Draft feedback forms	10/19/21
e. Present data collection instruments to Evaluation Committee and collect feedback	11/15/21
f. Finalize instruments and protocols	11/30/21
4. Collect data	**1/31/2022**
a. Baseline data collection (Fall Term data collection)	1/31/2022
b. Virtual site visit	1/31/2022
5. Data analysis & interpretation of findings	**3/1/2022**
a. Survey analysis	2/4/2022
b. Documentation analysis	2/18/2022
c. Interview analysis	2/18/2022
d. Sense-making session	3/1/2022
6. Communication and Reporting	**6/17/2022**
a. Report draft	3/29/2022
b. Report debrief with project director (including discussion on thresholds)	4/1/2022
c. Year 1 Annual Report	4/15/2022
d. End of Year Briefing	6/17/2022

Table 2: Tentative Work Plan (Years 2-3)

Data Collection	**8/26/2022**
a. Spring Term data collection	5/30/2022
b. Summer Term data collection	8/26/2022
Update evaluation plan	**8/31/2022**
a. Revise evaluation plan as needed	8/31/2022
b. Develop work plan for Year 2	7/29/2022
Data analysis	**12/1/2022**
a. Survey analysis	11/1/2022
b. Documentation analysis	12/1/2022
Mid-year Briefing of preliminary findings	**12/16/2022**
Data Collection	**1/31/2023**
a. Fall Term reporting	1/14/2023
b. In-person site visit	1/31/2023
Data analysis & interpretation of findings	**3/1/2023**
a. Survey analysis	2/3/2023
b. Interview analysis	2/17/2023
c. Documentation analysis	2/17/2023
d. Sense-making session	3/1/2023
Communication and Reporting	**6/16/2023**
a. Report draft	3/28/2023
b. Report debrief with project director	3/31/2023
c. Annual report	4/14/2023
d. End of Year Briefing	6/16/2023
Data Collection	**8/25/2023**
a. Spring Term data collection	5/30/2023
b. Summer Term data collection	8/25/2023
Update evaluation plan	**8/31/2023**
a. Revise evaluation plan as needed	8/31/2023
b. Develop work plan for Year 3	7/31/2023
Data analysis	**12/1/2023**
a. Survey analysis	11/1/2023

b. Documentation analysis	12/1/2023
Mid-year Briefing of preliminary findings	**12/15/2023**
Data Collection	**1/31/2024**
a. Fall Term reporting	1/12/2024
b. In-person site visit	1/31/2024
Data analysis & interpretation of findings	**3/1/2024**
a. Survey analysis	2/7/2024
b. Interview analysis	2/16/2024
c. Documentation analysis	2/16/2024
d. Sense-making session	3/1/2024
Communication and Reporting	**6/15/2024**
a. Report draft	3/25/2024
b. Report debrief with project director	3/29/2024
c. Final report	4/12/2024
d. Final Report Debriefing	6/15/2024

APPENDIX B: DATA COLLECTION INSTRUMENTS

Detailed Implementation Report

Central Florida STEM Alliance: Project Implementation Report

Institution: _____ **Year:** _____ **Semester:**_____

Student Focused Activities				
SF 1-2: Summer Bridge Program				
Planned Implementation:	X/X-X/X	**Actual Implementation:**	X/X-X/X	
Question	**Evidence**		**Required Artifacts**	**Additional Artifacts**
What percentage of the targeted population participated in the Summer STEM Institute?			• *Rosters of Summer STEM Institute Program*	
How many workshops and presentations by STEM professionals and college/university faculty were offered?			• *Schedule from Summer STEM Institute or other document that specifies workshops offered*	
How many students from your institution participated in the hybrid Summer STEM Institute? How many students from your institution participated in the virtual Summer STEM Institute?			• *Schedule from hybrid/virtual Summer STEM Institute; Rosters from hybrid/virtual Summer STEM Institute*	
Were hands-on STEM activities included in the Summer STEM Institute?			• *Schedule from Summer STEM Institute*	

		• *Various documentation (e.g., photos)*	
Were activities on STEM Career Pathways included in the Summer STEM Institute?		• *Schedule from Summer STEM Institute*	
Was information on institutional resources and tools to support college readiness and success shared at the Summer STEM institute?		• *Schedule from Summer STEM Institute* • *Various documentation (e.g., photos, copies of resources)*	
Were activities the UN Sustainable Development Goals included in the Summer STEM Institute?		• *Schedule from Summer STEM Institute*	
Did students develop projects to support attainment of the UN SDGs in their local communities?		• *Schedule from Summer STEM Institute* • *Roster of students with project status*	
What % of students completed mathematics assessments to determine their math skill level?		• *De-identified student-level records with assessment scores*	
What % of students met with a STEM advisor to discuss math course placement?		• *Spreadsheet with student participation (i.e., advisor meetings, activities) by student*	
Is a math course waiver option available for students who completed advising and necessary standardized tests/assessments at your institution?		• *Documentation (e.g., student information packet, roster of students who earned course waivers) of*	

		course waiver opportunity	
How many students utilized course waivers (if applicable)?		• *Advising Log*	
SF 3: Student Recruitment and Engagement			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
What percent of LSAMP students participated in orientation?		• *Student Activity Log*	
What percent of LSAMP students belong to racially and ethnically minoritized groups?		• *Roster of LSAMP Students with race/ethnicity*	
What percent of LSAMP students met with advisors at least one time this semester?		• *Advising Log*	
What percent of LSAMP students participated in at least 3 LSAMP experiences this semester?		• *Student Activity Log*	
SF 4: Dedicated STEM Academic Advising			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
What percent of LSAMP students worked with academic advisors to develop educational plans or academic transfer plans?		• *Advising Log*	
What percent of LSAMP students met with advisors who		• *Advising Log*	

discussed CFSA engagement opportunities?			
What percent of LSAMP students met with advisors who referred them to other departments?		• *Advising Log*	
What percent of LSAMP students flagged at risk met with advisors over retention concerns?		• *Advising Log*	
SF 5-6 : Student-led STEM Skill Building and Peer Support			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Did LSAMP students (including Peer Coaches and STEM club members) lead presentations and engagement opportunities for other LSAMP students and the broader STEM community?		• *LSAMP Engagement Opportunity Log*	
Did Peer Coaches and STEM Club members facilitate informal support sessions for peers?		• *LSAMP Engagement Opportunity Log*	
Were STEM skill-building workshops and peer supports offered virtually or did they use technology to engage students across institutions?		• *LSAMP Engagement Opportunity Log*	
Did Peer Coaches facilitate study groups, activities, or mentor students in completion of research projects?		• *LSAMP Engagement Opportunity Log*	
Did students lead activities (e.g., group study sessions,		• *LSAMP Engagement Opportunity Log*	

tutoring in STEM subjects, peer-led workshops)?			
SF 7-9: STEM Identity, Professional Experiences, and Conferences			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Were on-campus and virtual workshops offered to learn about STEM careers, enhance STEM identity, and expand STEM networks?		• *Engagement Opportunity Log*	
How did your institution promote STEM Student community and support student interaction, workshops, and presentations by STEM professionals?		• *Documentation of promotion (e.g., Newsletter)*	
How did LSAMP team members support students in competing for national research and internship opportunities?		• *Advising Log*	
Did students attend the annual STEM Summit?		• *Roster of STEM Summit attendees*	
How many students attended national STEM conferences?		• *List of students who attended or presented at STEM conferences*	
How did LSAMP team members support students in submitting proposals to national STEM conferences?		• *List of students who attended or presented at STEM conferences* • *Documentation (e.g., workshop fliers, newsletter)*	

Were in-person and virtual lab tours offered in STEM discipline areas at 4-year institutions?		• *List of college and industry tours* • *Rosters from in-person and virtual lab tours*	
Were in-person and virtual STEM tours offered in STEM industry areas?		• *List of college and industry tours* • *Rosters from in-person and virtual industry tours*	
Were college tours offered at university partners' institutions?		• *List of college and industry tours* • *Rosters from college tours*	
SF 7-9: STEM Identity, Professional Experiences, and Conferences			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Were LSAMP research scholars selected and awarded funding?		• *Roster of LSAMP Research Scholars*	
What percent of LSAMP Research Scholars conducted research on-campus or through external placements with industry or university partners?		• *STEM Professionalization Experience Log*	
What percent of LSAMP Research Scholars engaged in the minimum 40-hour research, internship, or lab experience requirement?		• *STEM Professionalization Experience Log*	
What percent of LSAMP Research Scholars presented work at the LSAMP Showcase?		• *STEM Professionalization Experience Log*	

Were Community Interns selected and awarded funding?		• *Roster of Community Interns*	
What percent of Community Interns engaged in the minimum 25-hour internship?		• *STEM Professionalization Experience Log*	
What percent Community Interns presented internship experiences as artifacts?		• *STEM Professionalization Experience Log*	
Were Peer Coaches selected and awarded funding?		• *Roster of LSAMP Research Scholars*	
What percent of Peer Coaches led/developed workshops and other opportunities?		• *STEM Professionalization Experience Log*	
What percent of Peer Coaches engaged in the minimum 40-hours of peer support?		• *STEM Professionalization Experience Log*	
What percent of Peer Coaches presented work at the LSAMP Showcase?		• *STEM Professionalization Experience Log*	

Faculty Focused Activities			
FF 1: Diversity and Inclusion in STEM			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Were workshops offered to faculty to support the engagement of URM students in STEM and undergraduate research?		• *Agendas from faculty workshops*	
How many faculty members participated in workshops?		• *Rosters of faculty workshop attendees*	

FF 2-4: Faculty and Staff Engagement			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
How many faculty members served as research mentors?		• *Student Activity Log* • *Faculty Participation Log*	
How many faculty members participated in the Summer STEM Institute?		• *Roster of faculty participation*	
How many faculty members participated in STEM clubs, conferences, field trips, and other activities?		• *Roster of faculty participation*	
What percentage of faculty participate in CFSA working groups?		• *Faculty Participation Log*	
What percentage of faculty participate in institution-specific implementation teams?		• *Faculty Participation Log*	
Did faculty have opportunities to connect across institutions?		• *List of opportunities for faculty to connect* • *Roster of attendees*	

Department/Institution Focused Activities			
DIF 1-2: Targeted STEM Pathways			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Were steps taken to develop articulation agreements with expanded university partners?		• *Copies of articulation agreements*	
Were steps taken to develop STEM degree pathways with university partners?		• *Documentation of STEM degree pathways*	
Were steps taken to develop data sharing agreements with university partners?		• *Copies of data sharing agreements*	
Were there regular meetings of the Assessment and Evaluation group?		• *Agendas* • *Attendance rosters*	

Central Florida STEM Alliance
Strategic Indicators Year 1

Institution: **Year:**

Strategic Indicators	Current Measure	Data Source
SI.1: How many LSAMP URMs declared a STEM major this year?		Degree seeking status; education plan designation
SI.2: What percentage of LSAMP URM students maintained a GPA of 2.75 or higher?		Cumulative GPA
SI.3a: What percentage of LSAMP URM students were retained? What percentage of [comparison group] students were retained?		IR Office Data
SI.3b: What percentage of LSAMP URM students persisted? What percentage of [comparison group] students persisted?		IR Office Data
SI.4a: How many students participated as Community Interns, Research Scholars, and/or Peer Coaches?		STEM Professionalization Log
SI.4b: How many students who did not participate in STEM professionalization experiences participated in 30 hours of activities?*		Student Activity Log
SI.5: What percentage of students participated in social justice STEM opportunities?		Student Activity Log
SI.6: What percentage of LSAMP URM students graduated with their Associate's degree this year?		Graduation records
SI.7: What percentage of LSAMP URM students submitted transfer applications to STEM majors in 4-year baccalaureate programs?		IR Office Data

Strategic Indicators	Current Measure	Data Source
SI.7: What percentage of LSAMP URM students transferred to STEM majors in 4-year baccalaureate programs?		IR Office Data

* The current measure for this strategic indicator can be omitted if the Student Activity Log is consistently used and submitted.

Faculty and Student Participation in LSAMP Activities

Semester	Number of Activities	Number of Students	Number of Faculty and Staff
Fall 2021			
Spring 2022			
Summer 2022			

LSAMP Enrollment

Racial/Ethnic Identification	Number
Black	
Hispanic	
Native American	
Native Hawaiian or Native Pacific Islander	
Total URM	
Asian	
White	
Multi-racial	
Do not wish to disclose	
Total Other	
Total CFSA Enrollment	

Advising Log

Student Information			Math Placement Advising Meeting		Risk for Retention		Fall Advising Meeting # 1					
Institution	**School Year**	**Student ID**	**Math Placement Advising Meeting**	**Math Course Waiver**	**Student flagged at risk for retention?**	**Advisor Action**	**Fall Advising Meeting Date**	**Fall Advising Meeting Topic # 1**	**Fall Advising Meeting Topic # 2**	**Fall Advising Meeting Topic # 3**	**Fall Advising Meeting Topic # 4**	**Fall Advising Meeting Other Information**
Valencia	*2021-2022*	*10000000*	*8/18/21*	*Y*	*Y*	*Met on 10/27/21. Discussed current grade in BIOL 1101. Reviewed applicable workshops at Academic Achievement Center, Supplementary Instruction schedule, and meeting with professor during office hours. Plan to check in again on 11/5/21.*	*8/27/21*	*Established educational plan.*	*Referred to other departments.*	*Discussed conference presentation opportunities.*		*N/A*

Fall Advising Meeting # 2						Fall Advising Meeting # 3					
Fall Advising Meeting Date	**Fall Advising Meeting Topic # 1**	**Fall Advising Meeting Topic # 2**	**Fall Advising Meeting Topic # 3**	**Fall Advising Meeting Topic # 4**	**Fall Advising Meeting Other Information**	**Fall Advising Meeting Date**	**Fall Advising Meeting Topic # 1**	**Fall Advising Meeting Topic # 2**	**Fall Advising Meeting Topic # 3**	**Fall Advising Meeting Topic # 4**	**Fall Advising Meeting Other Information**
10/27/21	*Identified/prepared for CFSA engagement opportunities.*	*Responded to retention concerns.*	*Other*		*Recommendation for Jorgensen scholarship.*	*N/A*					

Spring Advising Meeting # 1						Spring Advising Meeting # 2					
Spring Advising Meeting Date	**Spring Advising Meeting Topic # 1**	**Spring Advising Meeting Topic # 2**	**Spring Advising Meeting Topic # 3**	**Spring Advising Meeting Topic # 4**	**Spring Advising Meeting Other Information**	**Spring Advising Meeting Date**	**Spring Advising Meeting Topic # 1**	**Spring Advising Meeting Topic # 2**	**Spring Advising Meeting Topic # 3**	**Spring Advising Meeting Topic # 4**	**Spring Advising Meeting Other Information**
1/25/22	*Discussed conference attendance opportunities.*	*Discussed conference presentation opportunities.*	*Discussed research/internship opportunities.*	*Referred to other departments.*		*N/A*					

Spring Advising Meeting # 3					
Spring Advising Meeting Date	**Spring Advising Meeting Topic # 1**	**Spring Advising Meeting Topic # 2**	**Spring Advising Meeting Topic # 3**	**Spring Advising Meeting Topic # 4**	**Spring Advising Meeting Other Information**
N/A					

Engagement Opportunity Log

Institution	School Year	Date of Opportunity	Title of Opportunity	Hours	Leader Role	Modality	Number of Student Attendees	Number of Faculty Attendees	Roster Provided (Y/N)
Valencia	*2021-2022*	*8/17/21*	*Finding Your STEM Pathway*	*1.5*	*Faculty*	*Virtual*	*32*	*4*	*Y*

Faculty Log

Institution	School Year	Faculty Member	Department	Research Mentor (Y/N)	CFSA Working Group	Institution Specific Implementation Team (Y/N)
Valencia	*2021-2022*	*Dr. Cindy Robbins*	Biology	*Y*	*Evaluation*	*Y*

STEM Professionalization Experience Log

Institution	School Year	Student ID	Program	Semester	Research/Internship Location (n/a if Peer Coach)	Hours Participated	Culminating Project Completion (Y/N)
Valencia	*2021-2022*	*10000000*	*Research Scholar*	*Fall 2021*	*Biology Lab*	*45*	*Y*

Student Activity Log

Institution	School Year	Student ID	Orientation	Fall LSAMP Experience # 1	Fall LSAMP Experience # 2
Valencia	*2021-2022*	*10000000*	*8/17/21*	*Career Workshop (9/19/21)*	*Valencia Lab Tour (10/23/21)*

Fall LSAMP Experience # 3	Spring LSAMP Experience # 1	Spring LSAMP Experience # 2	Spring LSAMP Experience # 3	Research Mentor (Y/N; Faculty Member Name)
Opportunities in BioTech Workshop (11/3/21)	*Study Skills to Support STEM Students (1/19/22)*	*Jefferson Labs Tour (2/23/22)*	*Transitioning to a 4-year Institution Workshop (3/3/22)*	*Y; Dr. Evans (Biology)*

LSAMP Survey Composition

	Initial Information	Demographics	STEM Self-Efficacy	Pre-Program Scale	Post-Program Scale	Program Feedback	Current Status/Plans	Strategic Indicator Scales
Baseline Survey	X	X	X	X				X
Pulse Survey	X					X		
Annual Survey	X		X	X				X
Pre-Graduation Survey	X		X		X	X	X	X
Alumni Survey	X		X		X		X	X

Specification Table: Survey

Scale	Item	Description of Item	SF Fidelity	FF Fidelity	DIF Fidelity	Process	Strategic Indicators	Supplemental Indicators
Research Self-Efficacy Scale	1a-f	Research Self-Efficacy Scale					9-10	
Research Self-Efficacy Scale	2	Preliminary question to determine if questions 4-5 should be asked						
Research Self-Efficacy Scale	3	Preliminary question to determine if questions 4-5 should be attributed to LSAMP						
Research Self-Efficacy Scale	4a-d	Sources of Self-Efficacy Scale					9-10	
Research Self-Efficacy Scale	5a-f	Sources of Self-Efficacy Scale					9-10	
Research Self-Efficacy Scale	6a-d	Sources of Self-Efficacy Scale					9-10	
Research Self-Efficacy Scale	7a-c	Science Identity Scale					8-10	
Pre-Program Scale	1a-q	Mentoring; understanding how mentoring experiences supported students (narrative support)	6.1, 10.3	2.1		1-3		3
Pre-Program Scale	2a-j	Confidence as a Scientist					9-10	
Pre-Program Scale	3a-f	Identity as a Scientist					9-10	
Pre-Program Scale	4a-g	Commitment to Science					8-10	
Pre-Program Scale	5-12	Science Education					8	2

Pre-Program Scale	13	Science Education						2
Pre-Program Scale	16a-j	Impact of Background on Science Experience					8	
Post-Program Scale: Part 1	1	Preliminary question to determine if question 2 should be asked						
Post-Program Scale: Part 1	2	Value of Financial Support from STEM Professionalization	10.1, 11.1, 12.1					
Post-Program Scale: Part 1	3a-q	Mentoring; understanding how mentoring experiences supported students (narrative support)	6.1, 10.3	2.1		1-3		3
Post-Program Scale: Part 2	1a-j	Confidence as a Scientist					9-10	
Post-Program Scale: Part 2	2a-f	Identity as a Scientist					9-10	
Post-Program Scale: Part 2	3a-g	Commitment to Science					8-10	
Post-Program Scale: Part 2	4-5	Science Education					8	2
Post-Program Scale: Part 2	6a-j	Impact of Background on Science Experience					8	
Program Feedback	1	Preliminary question to determine if question 2 should be asked						
Program Feedback	2a-f	Preliminary question to determine if advising should be atributed to LSAMP						
Program Feedback	2b (i-vii)	Advising Questions						3
Program Feedback	2b(viii)	Overall Satisfaction with Advising	4.5					
Program Feedback	2c-d	Open-ended STEM Academic Adviising				1, 6		
Program Feedback	3	Preliminary question to determine if question 4 should be asked						
Program Feedback	4a-b	Participating as an LSAMP Research Scholar						1
Program Feedback	4c	Monetary Benefits	10.1					
Program Feedback	4d-f	Open-ended Research Scholar questions				1,2,6		

Program Feedback	5	Preliminary question to determine if question 6 should be asked						
Program Feedback	6a-b	Participating as an LSAMP Community Intern						1
Program Feedback	6c	Changes from being a community intern					5	1
Program Feedback	6d	Monetary Benefits	11.1					
Program Feedback	6e-g	Open-ended Research Scholar questions				1,2,6		
Program Feedback	7	Preliminary question to determine if question 8 should be asked						
Program Feedback	8a	Participating as an LSAMP Research Scholar						1
Program Feedback	8b	Monetary Benefits	12.1					
Program Feedback	8c-e	Open-ended Research Scholar questions				1,2,6		
Program Feedback	9a	Connected to Institution					8	
Program Feedback	9b	Connected to Peers					8	
Program Feedback	9c	Connected to STEM					8	
Program Feedback	9d	Build STEM Skills	5.4					
Program Feedback	9e	Build Connections with Peers at my institution	5.2					3
Program Feedback	9f	Build Connections with Peers at other institutions	5.2					3
Program Feedback	9g	Develop Identity in STEM					9-10	
Program Feedback	9h	Explore STEM Careers	7.1					
Program Feedback	9i	Decide on a career path						2
Program Feedback	10	Significant Aspect on Continuing in STEM				10		

LSAMP Baseline Survey/Annual Survey

As a participant in the Louis Stokes Alliances for Minority Participation (LSAMP) program at your institution, you are invited to complete this survey.

This survey is being conducted by Shaffer Evaluation Group, an independent educational evaluation firm commissioned by Valencia College and the Central Florida STEM Alliance (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College) to gain a better understanding of the implementation and effectiveness of the LSAMP Program. It is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP Program at your institution.

Confidentiality and Participation
Participation in the survey is voluntary and non-participation will have no impact on you. You may skip questions on the survey or discontinue participation at any time. Your decision to participate or not participate will not affect your support from the LSAMP program, your relationships with faculty, administration, or with the institution in general. There is minimal risk of breach of confidentiality. Procedures are in place to minimize this risk. All information that would permit identification of an individual respondent will be held in strict confidence, will be used by only persons engaged in and for the purpose of the survey, and will not be disclosed or released to others, including the staff and faculty of your institution (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College), for any purpose except as required by law. You will not be identified by name, and information from the study will be reported only in the aggregate at the program level.

Completing the Survey

We estimate that it will take approximately 20 minutes to complete the survey. If you have questions about the study, please contact Stacy Hayden, the evaluation study Research Associate (stacy@shafferevaluation.com) or Patricia Moore Shaffer, the evaluation study director (patricia@shafferevaluation.com). By completing this survey, you acknowledge that you are at least 18 years of age and voluntarily grant permission for the use of your survey responses as part of the CFSA Paths LSAMP evaluation.

Consent

I am at least 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation as described above.

- Yes, I am 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.
- No, I do not agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.

Initial Information

1. Student ID

2. What institution do you attend?
    - College of Central Florida
    - Pasco-Hernando State College
    - Polk State College
    - Valencia College

Demographics (Baseline Survey Only)

1. Age (Open ended; two digits)
2. Gender Identity
    - Male
    - Female
    - Prefer Not to Say
3. Ethnicity (Please select all that apply)
    - American Indian or Alaska Native
    - Asian
    - Black or African American
    - Hispanic or Latino
    - Native Hawaiian or Other Pacific Islander
    - White
    - Other (please specify) _____

STEM Self-Efficacy Scales (Byars-Winston, et al., 2016)

Research Self-Efficacy Scale

1. How much confidence do you have in your ability to: (1=no confidence, 5=complete confidence)
    - Excel in your science major over the next two semesters?
    - Pursue a research science career?
    - Complete a science degree?
    - Persist with science courses even though you may be a minority in them?
    - Pursue a graduate degree in science?
    - Complete a graduate degree in science?

Preliminary Questions to Sources of Self-Efficacy Scale

2. Have you participated in a STEM research experience previously?
    - Yes
    - No
3. IF YES to 2: Was your research experience through LSAMP at your institution?
    - Yes
    - No

Sources of Self-Efficacy Scale

4. IF YES to 2: Based on feedback from your research mentor (e.g., the person who you conducted STEM research under), in your last research experience how well did you: (1-not well at all, 2-somewhat well, 3- well, 4- very well, 5- extremely well)
    - Independently conduct experiments or a research project?
    - Analyze research data?
    - Write a scientific report?
    - Prepare a scientific poster or presentation?

5. IF YES to 2: Please rate your agreement with the following statements (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - My primary research mentor showed me how to conduct a research procedure.
    - I look up to my research mentor as a career role model.
    - My research mentor encouraged me to pursue a research science career.
    - My research mentor told me I have the ability to be a scientist.
    - I felt nervous when conducting research.
    - I felt anxious about my ability to do research.
6. A research science career would allow me to: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - Do work that makes a difference in people's lives or society
    - Do work that I find satisfying
    - Go into a field with high employment demand
    - Earn an attractive salary

Science Identity Scale

7. During my most recent research experience, I: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree, I have not had a research experience)
    - Felt like a scientist
    - Interacted with scientists from outside of my school
    - Felt part of a scientific community

Pre-Program Scale (Syed, et al., 2018)

Mentoring

1. As an undergraduate you may have had a range of different people play the role of mentor: faculty members, program staff, graduate students, peers. A mentor is anyone more experienced than you who has given you individual support related to your development as a science student. Please think back to the mentoring you received, including people who were not formally designated as "mentors." Describe the extent to which your mentor(s) provided you with the following opportunities. (1-Not at all, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- To a very large extent). One or more of your mentors during your undergraduate experience has:
    - Given you challenging assignments that presented opportunities to learn new skills.
    - Helped you meet other people in your field at the college.
    - Helped you figure out for yourself how to answer a research question.
    - Helped you figure out for yourself how to understand and explain your research results.
    - Conveyed empathy for the concerns and feelings you have discussed with them.
    - Provided a consistent place you could go to for assistance or support.
    - Encouraged you to talk openly about anxiety and fears that detract from your work.
    - Shared personal experiences as an alternative perspective to your problems.
    - Discussed your questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and supervisors, or work/family conflicts.
    - Shared the history of his/her career with you.
    - Encouraged you to prepare for the next steps in your academic program and/or career.
    - Listened when you talked.
    - Served as a role model.

- Displayed attitudes and values similar to your own.
- Helped you with a presentation (either within your college or at a conference).
- Helped you make an informed decision regarding career options.
- Taught you other specific research skills, or how to do a specific task.

Confidence as a Scientist

2. This section assesses your confidence in your abilities to function as a scientist. Indicate the extent to which you are confident you can successfully complete the following tasks. (1-Not at all confident, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- Absolutely confident). I am confident that I can …
    - Use technical science skills (use of tools, instruments, and/or techniques)
    - Use scientific language and terminology.
    - Generate a research question to answer.
    - Figure out what data/observations to collect and how to collect them.
    - Figure out/analyze what data/observations mean.
    - Create explanations for the results of the study.
    - Use scientific literature and/or reports to guide research.
    - Relate results and explanations to the work of others.
    - Develop theories (integrate and coordinate results from multiple studies).
    - Report research results in an oral presentation or written report.

Identity as a Scientist

3. The following questions ask how you think about yourself and your personal identity. We want to understand how much you think that being a scientist is part of who you are. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - In general, being a scientist is an important part of my self-image.
    - I have a strong sense of belonging to the community of scientists.
    - Being a scientist is an important reflection of who I am.
    - I have come to think of myself as a “scientist.”
    - I am a scientist.
    - My social network includes a lot of scientists and/or science students.

Commitment to Science

4. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - I intend to work in a job related to science.
    - I see the next steps in the field of science, and I intend to take them.
    - I will work as hard as necessary to achieve a career in science.
    - I expect that a career in this field will be very satisfying.
    - I feel that I am on a definite career path in science.
    - I definitely want a career for myself in science.
    - Science is the ideal field of study for my life.

Science Education

5. What school did you attend during the last academic year? (Please check one)
    - High school
    - Junior or Community College
    - 4-year College or University
    - Was not in school
6. What year in college are you entering next fall (Fall 2022)?
    - 1st

- 2nd
- 3rd
- 4th
- 5th
- 6th
- 7th
- 8th or more

7. Are you currently enrolled in a 4-year college? (Yes/No)
    - If 4-year college is selected for 5: Did you transfer from a community college? (Yes/No)
8. Have you ever declared a science or engineering major? (Yes/No)
9. Are you currently a science or engineering major? (Yes/No)
10. Do you plan to graduate as a science or engineering major? (Yes/No)
11. What kind of degree are you considering pursuing after graduating from college? (Check all that apply)
    a. No advanced degree
    - Science teaching cial for K-12 education
    - Ph.D. in STEM
    - Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)
    - Other health-related degree (Please specify)
    - Other advanced degree (Please specify)
    - Don't know
12. What kind of career do you intend to pursue? (Check all that apply)
    - No career
    - Teaching science (e.g., K-12 education, community college, four-year college or university)
    - Teaching technology (e.g., K-12 education, community college, four-year college or university)
    - Teaching engineering (e.g., K-12 education, community college, four-year college or university)
    - Teaching mathematics (e.g., K-12 education, community college, four-year college or university)
    - Science research (or research plus teaching)
    - Engineering research (or research plus teaching)
    - Medical research (or research plus teaching)
    - Technology research (or research plus teaching)
    - Mathematics research (or research plus teaching)
    - Medical practice
    - Other health profession (Please specify)
    - Industry position for science
    - Industry position for math
    - Industry position for technology
    - Industry position for engineering
    - Other career (Please specify)
    - Don't know

Impact of Background on Science Experience

13. We are interested in the impact of your background (e.g., ethnicity, gender, social class) on your experience as a science student. In the statements below, when we refer to your background, we want you to consider all aspects of your background that are important to

you, whether that's ethnicity, gender, social class, or other aspects. Please indicate your agreement with the following statements. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)

- Prior to enrolling in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
- Prior to enrolling in college, I had personal contact with one or more scientists who were the same gender as I am.
- While in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
- While in college, I had personal contact with one or more scientists who were the same gender as I am.
- While in college, I had one or more mentors who came from the same background as me.
- While in college, I had one or more mentors who understood how my background contributed to my experience as a science student.
- When I am a member of a science team, it is important to me to have others who share my background on the team with me.
- When I am in a leadership role in a science team, it is important to me to have others who share my background on the team with me.
- Thinking of myself as a scientist is compatible with other aspects of my background.
- Having more people with my background in my field makes me feel more like a scientist.

Alumni Survey

As an alumni of the Louis Stokes Alliances for Minority Participation (LSAMP) program at your institution, you are invited to complete this survey.

This survey is being conducted by Shaffer Evaluation Group, an independent educational evaluation firm commissioned by Valencia College and the Central Florida STEM Alliance (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College) to gain a better understanding of the implementation and effectiveness of the LSAMP Program. It is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP Program at your institution.

Confidentiality and Participation

Participation in the survey is voluntary and non-participation will have no impact on you. You may skip questions on the survey or discontinue participation at any time. Your decision to participate or not participate will not affect your support from the LSAMP program, your relationships with faculty, administration, or with the institution in general. There is minimal risk of breach of confidentiality. Procedures are in place to minimize this risk. All information that would permit identification of an individual respondent will be held in strict confidence, will be used by only persons engaged in and for the purpose of the survey, and will not be disclosed or released to others, including the staff and faculty of your institution (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College), for any purpose except as required by law. You will not be identified by name, and information from the study will be reported only in the aggregate at the program level.

Completing the Survey

We estimate that it will take approximately 20 minutes to complete the survey. If you have questions about the study, please contact Stacy Hayden, the evaluation study Research Associate (stacy@shafferevaluation.com). By completing this survey, you acknowledge that you are at least 18 years of age and voluntarily grant permission for the use of your survey responses as part of the CFSA Paths LSAMP evaluation.

Consent

I am at least 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation as described above.

- Yes, I am 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.
- No, I do not agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.

Initial Information

1. Student ID
2. What institution do you attend?
    - College of Central Florida
    - Pasco-Hernando State College
    - Polk State College
    - Valencia College

STEM Self-Efficacy Scales (Byars-Winston, et al., 2016)

Research Self-Efficacy Scale

3. How much confidence do you have in your ability to: (1=no confidence, 5=complete confidence)
    - Excel in your science major over the next two semesters?
    - Pursue a research science career?
    - Complete a science degree?
    - Persist with science courses even though you may be a minority in them?
    - Pursue a graduate degree in science?
    - Complete a graduate degree in science?

Preliminary Questions to Sources of Self-Efficacy Scale

4. Have you participated in a STEM research experience previously?
    - Yes
    - No
5. IF YES to 2: Was your research experience through LSAMP at your institution?
    - Yes
    - No

Sources of Self-efficacy Scale

6. IF YES to 2: Based on feedback from your research mentor (e.g., the person who you conducted STEM research under), in your last research experience how well did you: (1-not well at all, 2-somewhat well, 3- well, 4- very well, 5- extremely well)
    - Independently conduct experiments or a research project?
    - Analyze research data?
    - Write a scientific report?
    - Prepare a scientific poster or presentation?
7. IF YES to 2: Please rate your agreement with the following statements (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - My primary research mentor showed me how to conduct a research procedure.
    - I look up to my research mentor as a career role model.
    - My research mentor encouraged me to pursue a research science career.
    - My research mentor told me I have the ability to be a scientist.
    - I felt nervous when conducting research.
    - I felt anxious about my ability to do research.
8. A research science career would allow me to: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - Do work that makes a difference in people's lives or society
    - Do work that I find satisfying
    - Go into a field with high employment demand
    - Earn an attractive salary

Science Identity Scale

9. During my most recent research experience, I: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree, I have not had a research experience)
    - Felt like a scientist
    - Interacted with scientists from outside of my school
    - Felt part of a scientific community

Post-Program Survey Part 1 (Syed, et al., 2018)

Mentoring

10. As an undergraduate you may have had a range of different people play the role of mentor: faculty members, program staff, graduate students, peers. A mentor is anyone more experienced than you who has given you individual support related to your development as a science student. Please think back to the mentoring you received, including people who were not formally designated as "mentors." Describe the extent to which your mentor(s) provided you with the following opportunities. (1-Not at all, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- To a very large extent). One or more of your mentors during your undergraduate experience has:
    - Given you challenging assignments that presented opportunities to learn new skills.
    - Helped you meet other people in your field at the college.
    - Helped you figure out for yourself how to answer a research question.
    - Helped you figure out for yourself how to understand and explain your research results.
    - Conveyed empathy for the concerns and feelings you have discussed with them.
    - Provided a consistent place you could go to for assistance or support.
    - Encouraged you to talk openly about anxiety and fears that detract from your work.
    - Shared personal experiences as an alternative perspective to your problems.
    - Discussed your questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and supervisors, or work/family conflicts.
    - Shared the history of his/her career with you.
    - Encouraged you to prepare for the next steps in your academic program and/or career.
    - Listened when you talked.
    - Served as a role model.
    - Displayed attitudes and values similar to your own.
    - Helped you with a presentation (either within your college or at a conference).
    - Helped you make an informed decision regarding career options.
    - Taught you other specific research skills, or how to do a specific task.

Post-Program Survey Part 2 (Syed, et al., 2018)

Confidence as a Scientist

11. This section assesses your confidence in your abilities to function as a scientist. Indicate the extent to which you are confident you can successfully complete the following tasks. (1-Not at all confident, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- Absolutely confident). I am confident that I can …
    - Use technical science skills (use of tools, instruments, and/or techniques)
    - Use scientific language and terminology.
    - Generate a research question to answer.
    - Figure out what data/observations to collect and how to collect them.
    - Figure out/analyze what data/observations mean.
    - Create explanations for the results of the study.

- Use scientific literature and/or reports to guide research.
- Relate results and explanations to the work of others.
- Develop theories (integrate and coordinate results from multiple studies).
- Report research results in an oral presentation or written report.

Identity as a Scientist

12. The following questions ask how you think about yourself and your personal identity. We want to understand how much you think that being a scientist is part of who you are. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - In general, being a scientist is an important part of my self-image.
    - I have a strong sense of belonging to the community of scientists.
    - Being a scientist is an important reflection of who I am.
    - I have come to think of myself as a "scientist."
    - I am a scientist.
    - My social network includes a lot of scientists and/or science students.

Commitment to Science

13. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - I intend to work in a job related to science.
    - I see the next steps in the field of science, and I intend to take them.
    - I will work as hard as necessary to achieve a career in science.
    - I expect that a career in this field will be very satisfying.
    - I feel that I am on a definite career path in science.
    - I definitely want a career for myself in science.
    - Science is the ideal field of study for my life.

Science Education: Current and Future

14. What kind of degree are you considering pursuing after graduating from college? (Check all that apply
    - No advanced degree
    - Science teaching credential for K-12 education
    - Ph.D. in STEM
    - Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)
    - Other health-related degree (Please specify)
    - Other advanced degree (Please specify)
    - Don't know
15. What kind of career do you intend to pursue? (Check all that apply)
    - No career
    - Teaching science (e.g., K-12 education, community college, four-year college or university)
    - Teaching technology (e.g., K-12 education, community college, four-year college or university)
    - Teaching engineering (e.g., K-12 education, community college, four-year college or university)
    - Teaching mathematics (e.g., K-12 education, community college, four-year college or university)
    - Science research (or research plus teaching)
    - Engineering research (or research plus teaching)
    - Medical research (or research plus teaching)

- Technology research (or research plus teaching)
- Mathematics research (or research plus teaching)
- Medical practice
- Other health profession (Please specify)
- Industry position for science
- Industry position for math
- Industry position for technology
- Industry position for engineering
- Other career (Please specify)
- Don't know

Impact of Background on Science Experience

16. We are interested in the impact of your background (e.g., ethnicity, gender, social class) on your experience as a science student. In the statements below, when we refer to your background, we want you to consider all aspects of your background that are important to you, whether that's ethnicity, gender, social class, or other aspects. Please indicate your agreement with the following statements. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Prior to enrolling in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
    - Prior to enrolling in college, I had personal contact with one or more scientists who were the same gender as I am.
    - While in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
    - While in college, I had personal contact with one or more scientists who were the same gender as I am.
    - While in college, I had one or more mentors who came from the same background as me.
    - While in college, I had one or more mentors who understood how my background contributed to my experience as a science student.
    - When I am a member of a science team, it is important to me to have others who share my background on the team with me.
    - When I am in a leadership role in a science team, it is important to me to have others who share my background on the team with me.
    - Thinking of myself as a scientist is compatible with other aspects of my background.
    - Having more people with my background in my field makes me feel more like a scientist.

Pre-Graduation Survey

As a participant in the Louis Stokes Alliances for Minority Participation (LSAMP) program at your institution, you are invited to complete this survey.

This survey is being conducted by Shaffer Evaluation Group, an independent educational evaluation firm commissioned by Valencia College and the Central Florida STEM Alliance (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College) to gain a better understanding of the implementation and effectiveness of the LSAMP Program. It is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP Program at your institution.

Confidentiality and Participation
Participation in the survey is voluntary and non-participation will have no impact on you. You may skip questions on the survey or discontinue participation at any time. Your decision to participate or not participate will not affect your support from the LSAMP program, your relationships with faculty, administration, or with the institution in general. There is minimal risk of breach of confidentiality. Procedures are in place to minimize this risk. All information that would permit identification of an individual respondent will be held in strict confidence, will be used by only persons engaged in and for the purpose of the survey, and will not be disclosed or released to others, including the staff and faculty of your institution (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College), for any purpose except as required by law. You will not be identified by name, and information from the study will be reported only in the aggregate at the program level.

Completing the Survey

We estimate that it will take approximately 20 minutes to complete the survey. If you have questions about the study, please contact Stacy Hayden, the evaluation study Research Associate (stacy@shafferevaluation.com) or Patricia Moore Shaffer, the evaluation study director (patricia@shafferevaluation.com). By completing this survey, you acknowledge that you are at least 18 years of age and voluntarily grant permission for the use of your survey responses as part of the CFSA Paths LSAMP evaluation.

Consent

I am at least 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation as described above.

- Yes, I am 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.
- No, I do not agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.

Initial Information

1. Student ID
2. What institution do you attend?

- College of Central Florida
- Pasco-Hernando State College
- Polk State College
- Valencia College

STEM Self-Efficacy Scales (Byars-Winston, et al., 2016)

Research Self-Efficacy Scale

1. How much confidence do you have in your ability to: (1=no confidence, 5=complete confidence)
    - Excel in your science major over the next two semesters?
    - Pursue a research science career?
    - Complete a science degree?
    - Persist with science courses even though you may be a minority in them?
    - Pursue a graduate degree in science?
    - Complete a graduate degree in science?

Preliminary Questions to Sources of Self-Efficacy Scale

2. Have you participated in a STEM research experience previously?
    - Yes
    - No
3. IF YES to 2: Was your research experience through LSAMP at your institution?
    - Yes
    - No

Sources of Self-efficacy Scale

4. IF YES to 2: Based on feedback from your research mentor (e.g., the person who you conducted STEM research under), in your last research experience how well did you: (1-not well at all, 2-somewhat well, 3- well, 4- very well, 5- extremely well)
    - Independently conduct experiments or a research project?
    - Analyze research data?
    - Write a scientific report?
    - Prepare a scientific poster or presentation?
5. IF YES to 2: Please rate your agreement with the following statements (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - My primary research mentor showed me how to conduct a research procedure.
    - I look up to my research mentor as a career role model.
    - My research mentor encouraged me to pursue a research science career.
    - My research mentor told me I have the ability to be a scientist.
    - I felt nervous when conducting research.
    - I felt anxious about my ability to do research.
6. A research science career would allow me to: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree)
    - Do work that makes a difference in people's lives or society
    - Do work that I find satisfying
    - Go into a field with high employment demand
    - Earn an attractive salary

Science Identity Scale

7. During my most recent research experience, I: (1=strongly disagree, 2=disagree, 3= neither agree nor disagree, 4=agree, 5 strongly agree, I have not had a research experience)
    - Felt like a scientist

- Interacted with scientists from outside of my school
- Felt part of a scientific community

Post-Program Survey Part 1 (Syed, et al., 2018)

Mentoring

8. As an undergraduate you may have had a range of different people play the role of mentor: faculty members, program staff, graduate students, peers. A mentor is anyone more experienced than you who has given you individual support related to your development as a science student. Please think back to the mentoring you received, including people who were not formally designated as "mentors." Describe the extent to which your mentor(s) provided you with the following opportunities. (1-Not at all, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- To a very large extent). One or more of your mentors during your undergraduate experience has:
    - Given you challenging assignments that presented opportunities to learn new skills.
    - Helped you meet other people in your field at the college.
    - Helped you figure out for yourself how to answer a research question.
    - Helped you figure out for yourself how to understand and explain your research results.
    - Conveyed empathy for the concerns and feelings you have discussed with them.
    - Provided a consistent place you could go to for assistance or support.
    - Encouraged you to talk openly about anxiety and fears that detract from your work.
    - Shared personal experiences as an alternative perspective to your problems.
    - Discussed your questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and supervisors, or work/family conflicts.
    - Shared the history of his/her career with you.
    - Encouraged you to prepare for the next steps in your academic program and/or career.
    - Listened when you talked.
    - Served as a role model.
    - Displayed attitudes and values similar to your own.
    - Helped you with a presentation (either within your college or at a conference).
    - Helped you make an informed decision regarding career options.
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Post-Program Survey Part 2 (Syed, et al., 2018)

Confidence as a Scientist

9. This section assesses your confidence in your abilities to function as a scientist. Indicate the extent to which you are confident you can successfully complete the following tasks. (1-Not at all confident, 2- To a small extent, 3- To some extent, 4- To a large extent, 5- Absolutely confident). I am confident that I can …
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    - Figure out what data/observations to collect and how to collect them.
    - Figure out/analyze what data/observations mean.
    - Create explanations for the results of the study.
    - Use scientific literature and/or reports to guide research.
    - Relate results and explanations to the work of others.
    - Develop theories (integrate and coordinate results from multiple studies).

- Report research results in an oral presentation or written report.

Identity as a Scientist

10. The following questions ask how you think about yourself and your personal identity. We want to understand how much you think that being a scientist is part of who you are. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
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    - Being a scientist is an important reflection of who I am.
    - I have come to think of myself as a "scientist."
    - I am a scientist.
    - My social network includes a lot of scientists and/or science students.

Commitment to Science

11. Please indicate your agreement with the following items. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - I intend to work in a job related to science.
    - I see the next steps in the field of science, and I intend to take them.
    - I will work as hard as necessary to achieve a career in science.
    - I expect that a career in this field will be very satisfying.
    - I feel that I am on a definite career path in science.
    - I definitely want a career for myself in science.
    - Science is the ideal field of study for my life.

Science Education: Current and Future

12. What kind of degree are you considering pursuing after graduating from college? (Check all that apply)
    - No advanced degree
    - Science teaching credential for K-12 education
    - Ph.D. in STEM
    - Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)
    - Other health-related degree (Please specify)
    - Other advanced degree (Please specify)
    - Don't know

13. What kind of career do you intend to pursue? (Check all that apply)
    - No career
    - Teaching science (e.g., K-12 education, community college, four-year college or university)
    - Teaching technology (e.g., K-12 education, community college, four-year college or university)
    - Teaching engineering (e.g., K-12 education, community college, four-year college or university)
    - Teaching mathematics (e.g., K-12 education, community college, four-year college or university)
    - Science research (or research plus teaching)
    - Engineering research (or research plus teaching)
    - Medical research (or research plus teaching)
    - Technology research (or research plus teaching)
    - Mathematics research (or research plus teaching)

- Medical practice
- Other health profession (Please specify)
- Industry position for science
- Industry position for math
- Industry position for technology
- Industry position for engineering
- Other career (Please specify)
- Don't know

Impact of Background on Science Experience

14. We are interested in the impact of your background (e.g., ethnicity, gender, social class) on your experience as a science student. In the statements below, when we refer to your background, we want you to consider all aspects of your background that are important to you, whether that's ethnicity, gender, social class, or other aspects. Please indicate your agreement with the following statements. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Prior to enrolling in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
    - Prior to enrolling in college, I had personal contact with one or more scientists who were the same gender as I am.
    - While in college, I had personal contact with one or more scientists who were the same ethnicity as I am.
    - While in college, I had personal contact with one or more scientists who were the same gender as I am.
    - While in college, I had one or more mentors who came from the same background as me.
    - While in college, I had one or more mentors who understood how my background contributed to my experience as a science student.
    - When I am a member of a science team, it is important to me to have others who share my background on the team with me.
    - When I am in a leadership role in a science team, it is important to me to have others who share my background on the team with me.
    - Thinking of myself as a scientist is compatible with other aspects of my background.
    - Having more people with my background in my field makes me feel more like a scientist.

Program Feedback

15. Did you participate in academic advising about STEM during the [semester]?
    - Yes
    - No
16. If Yes to 1:
    - Please provide the name of your STEM advisor.[10]
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree, n/a)
        - My advisor answers my questions.
        - If my advisor does not know the answer to one of my questions, he/she makes the effort to connect me to someone who does.

[10] This information will only be used internally by Shaffer Evaluation Group to remove any student responses not associated with LSAMP advising.

        - The availability of my academic advisor is currently meeting my needs.
        - My academic advisor listens and respects me as an individual.
        - I am given the time I need during my advising appointment(s) and do not feel rushed.
        - My academic advisor is knowledgeable about careers that apply to my major.
        - I would recommend my academic advisor to other students.
        - Overall, I am satisfied with the STEM academic advising I am receiving.
    - What has been most beneficial about your STEM advising experience? (Open ended)
    - Do you have any suggestions for improving STEM academic advising?

17. Were you involved as an LSAMP Research Scholar during the [semester]?
    - Yes
    - No
18. If Yes to 17:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Research Scholar….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - The monetary award provided to LSAMP Research Scholars (Please select all that apply)
        - Allowed me to not hold a job this semester
        - Allowed me to work less hours at my job this semester
        - Helped me stay enrolled in school
    - What is one thing you learned as an LSAMP Research Scholar?
    - What was the most beneficial part of being an LSAMP Research Scholar?
    - What is one improvement that should be made to the LSAMP Research Scholar opportunity?
19. Were you involved as an LSAMP Community Intern during the [semester]?
    - Yes
    - No
20. If Yes to 19:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Community Intern….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - Please indicate your agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)

    - After participating as a LSAMP Community Intern, I better understood how my STEM career could make a difference in my community.
    - After participating as a LSAMP Community Intern, I better understood how social justice was linked to STEM.
    - After participating as a LSAMP Community Intern, I am motivated to work in a STEM Career where I can make a difference in my community.
  - The monetary award provided to LSAMP Community Interns (Please select all that apply)
    - Allowed me to not hold a job this semester
    - Allowed me to work less hours at my job this semester
    - Helped me stay enrolled in school
  - What is one thing you learned as an LSAMP Community Intern?
  - What was the most beneficial part of being an LSAMP Community Intern?
  - What is one improvement that should be made to the LSAMP Community Intern opportunity?
21. Were you involved as an LSAMP Peer Coach during the [semester]?
  - Yes
  - No
22. If Yes to 21:
  - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Peer Coach….
    - Was an enjoyable experience.
    - Made me more interested in pursuing a STEM degree.
    - Made me more interested in pursuing a STEM career.
    - Helped me gain valuable skills I would not have gained otherwise.
    - Provided me with professional connections I would not have gained otherwise.
  - The monetary award provided to LSAMP Peer Coaches (Please select all that apply)
    - Allowed me to not hold a job this semester
    - Allowed me to work less hours at my job this semester
    - Helped me stay enrolled in school
  - What is one thing you learned as an LSAMP Peer Coach?
  - What was the most beneficial part of being an LSAMP Peer Coach?
  - What is one improvement that should be made to the LSAMP Peer Coach opportunity?
23. In the next section, we would like to ask you about the activities that you have participated in as an LSAMP member. Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree). Participating in LSAMP activities…
  - Makes me feel more connected to my institution.
  - Makes me feel more connected to peers with similar interests.
  - Makes me feel connected to my intended field of study.
  - Has helped me build STEM Skills.
  - Has helped me build connections/network at my institution.
  - Has helped me build connections/network at other institutions.
  - Has helped me develop my identity in STEM (e.g., scientist, mathematician, engineer).
  - Has helped me explore STEM careers.

- Has helped me decide on a future career path.

24. What aspect of the program has had the most significant impact on you continuing in STEM?

Pulse Survey

As a participant in the Louis Stokes Alliances for Minority Participation (LSAMP) program at your institution, you are invited to complete this survey.

This survey is being conducted by Shaffer Evaluation Group, an independent educational evaluation firm commissioned by Valencia College and the Central Florida STEM Alliance (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College) to gain a better understanding of the implementation and effectiveness of the LSAMP Program. It is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP Program at your institution.

Confidentiality and Participation

Participation in the survey is voluntary and non-participation will have no impact on you. You may skip questions on the survey or discontinue participation at any time. Your decision to participate or not participate will not affect your support from the LSAMP program, your relationships with faculty, administration, or with the institution in general. There is minimal risk of breach of confidentiality. Procedures are in place to minimize this risk. All information that would permit identification of an individual respondent will be held in strict confidence, will be used by only persons engaged in and for the purpose of the survey, and will not be disclosed or released to others, including the staff and faculty of your institution (i.e., College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College), for any purpose except as required by law. You will not be identified by name, and information from the study will be reported only in the aggregate at the program level.

Completing the Survey

We estimate that it will take approximately 10 minutes to complete the survey. If you have questions about the study, please contact Stacy Hayden, the evaluation study Research Associate (stacy@shafferevaluation.com) or Patricia Moore Shaffer, the evaluation study director (patricia@shafferevaluation.com). By completing this survey, you acknowledge that you are at least 18 years of age and voluntarily grant permission for the use of your survey responses as part of the CFSA Paths LSAMP evaluation.

Consent

I am at least 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation as described above.

- Yes, I am 18 years of age and agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.
- No, I do not agree to participate in this survey as part of the CFSA Paths LSAMP evaluation.

Initial Information

1. Student ID
2. What institution do you attend?

- College of Central Florida
- Pasco-Hernando State College
- Polk State College
- Valencia College

Program Feedback

3. Did you participate in academic advising about STEM during the [semester]?
    - Yes
    - No
4. If Yes to 3:
    - Please provide the name of your STEM advisor.[11]
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree, n/a)
        - My advisor answers my questions.
        - If my advisor does not know the answer to one of my questions, he/she makes the effort to connect me to someone who does.
        - The availability of my academic advisor is currently meeting my needs.
        - My academic advisor listens and respects me as an individual.
        - I am given the time I need during my advising appointment(s) and do not feel rushed.
        - My academic advisor is knowledgeable about careers that apply to my major.
        - I would recommend my academic advisor to other students.
        - Overall, I am satisfied with the STEM academic advising I am receiving.
    - What has been most beneficial about your STEM advising experience? (Open ended)
    - Do you have any suggestions for improving STEM academic advising?
5. Were you involved as an LSAMP Research Scholar during the [semester]?
    - Yes
    - No
6. If Yes to 5:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Research Scholar….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - The monetary award provided to LSAMP Research Scholars (Please select all that apply)
        - Allowed me to not hold a job this semester
        - Allowed me to work less hours at my job this semester
        - Helped me stay enrolled in school
    - What is one thing you learned as an LSAMP Research Scholar?
    - What was the most beneficial part of being an LSAMP Research Scholar?

[11] This information will only be used internally by Shaffer Evaluation Group to remove any student responses not associated with LSAMP advising.

- What is one improvement that should be made to the LSAMP Research Scholar opportunity?

7. Were you involved as an LSAMP Community Intern during the [semester]?
    - Yes
    - No
8. If Yes to 7:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Community Intern….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - Please indicate your agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
        - After participating as a LSAMP Community Intern, I better understood how my STEM career could make a difference in my community.
        - After participating as a LSAMP Community Intern, I better understood how social justice was linked to STEM.
        - After participating as a LSAMP Community Intern, I am motivated to work in a STEM Career where I can make a difference in my community.
    - The monetary award provided to LSAMP Community Interns (Please select all that apply)
        - Allowed me to not hold a job this semester
        - Allowed me to work less hours at my job this semester
        - Helped me stay enrolled in school
    - What is one thing you learned as an LSAMP Community Intern?
    - What was the most beneficial part of being an LSAMP Community Intern?
    - What is one improvement that should be made to the LSAMP Community Intern opportunity?
9. Were you involved as an LSAMP Peer Coach during the [semester]?
    - Yes
    - No
10. If Yes to 9:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
        - Participating as a LSAMP Peer Coach….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - The monetary award provided to LSAMP Peer Coaches (Please select all that apply)
        - Allowed me to not hold a job this semester

    - Allowed me to work less hours at my job this semester
    - Helped me stay enrolled in school
  - What is one thing you learned as an LSAMP Peer Coach?
  - What was the most beneficial part of being an LSAMP Peer Coach?
  - What is one improvement that should be made to the LSAMP Peer Coach opportunity?
11. In the next section, we would like to ask you about the activities that you have participated in as an LSAMP member. Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree). Participating in LSAMP activities…
    - Makes me feel more connected to my institution.
    - Makes me feel more connected to peers with similar interests.
    - Makes me feel connected to my intended field of study.
    - Has helped me build STEM Skills.
    - Has helped me build connections/network at my institution.
    - Has helped me build connections/network at other institutions.
    - Has helped me develop my identity in STEM (e.g., scientist, mathematician, engineer).
    - Has helped me explore STEM careers.
    - Has helped me decide on a future career path.
12. What aspect of the program has had the most significant impact on you continuing in STEM?

Specification Table: Interviews and Focus Groups

Protocol	Section	Item	Description of Item	SF Fidelity	FF Fidelity	DIF Fidelity	Process	Strategic Indicators	Supplemental Indicators
Faculty Focus Group	STEM Professionalization Experiences	1	Overall Experience as Research Mentor		2.1				
Faculty Focus Group	STEM Professionalization Experiences	2	Benefits from participation as Research Scholars for students						2
Faculty Focus Group	STEM Professionalization Experiences	3	40 hour of research requirement for students	10.3			3		
Faculty Focus Group	STEM Professionalization Experiences	4	Improvements to Research Scholar Program				6		
Faculty Focus Group	STEM Professionalization Experiences	5a	Involvement in Community Intern/Peer Coach program						
Faculty Focus Group	STEM Professionalization Experiences	5b	Benefits from participation as Community Interns/Peer Coaches for students					2	
Faculty Focus Group	STEM Professionalization Experiences	5c	Improvements to Peer Coach/Community Intern Program				6		
Faculty Focus Group	Student Activities	6	Involvement with LSAMP Activities						
Faculty Focus Group	Student Activities	7	Overall opinion of activities				1		
Faculty Focus Group	Student Activities	8	Are activities beneficial for students				1		
Faculty Focus Group	Student Activities	9	Recommendations to activities				6		
Faculty Focus Group	Student Activities	10	Suggestion for activities to be offered				6		
Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	11	Involvement in CFSA Workgroups/Overall Experience		3.1		1-2		

Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	11a	Frequency of meeting with work group		3.1				
Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	11b	Successes/challenges of work group				3, 6		
Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	12	Involvement in CFSA Workgroups/Overall Experience		3.2		1-2		
Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	12a	Frequency of meeting with work group		3.2				
Faculty Focus Group	Participation in CFSA Work Groups/Implementation Teams	12b	Successes/challenges of work group				3, 6		
Faculty Focus Group	Sustainability	13	Aspects of LSAMP to be Sustained				4		
Faculty Focus Group	Sustainability	14	Overall impression of LSAMP				1,5, 6		
Faculty Focus Group	Sustainability	14a	What works in LSAMP				1,5, 6		
Faculty Focus Group	Sustainability	14b	What does not work in LSAMP				6		
Faculty Focus Group	Sustainability	14c	Recommendations about LSAMP						
Student Exit Interview	Get to Know You	1-3	Get to Know you Questions						
Student Exit Interview	Get to Know You	3a	LSAMP Experience				1		
Student Exit Interview	Future Plans	4	Future Plans						2
Student Exit Interview	Future Plans	5	Future Plans					7	2
Student Exit Interview	Overall Experience	6	Overall Experience with LSAMP				1,2		
Student Exit Interview	Overall Experience	7	Most Beneficial Aspects				1		
Student Exit Interview	Overall Experience	8	Program Improvements				6		

Student Exit Interview	Overall Experience	9	Anything else I should know?						
Student Focus Group	The LSAMP Program	1	Hear about LSAMP				3		
Student Focus Group	The LSAMP Program	2	What made you decide to become an LSAMP Member				3		
Student Focus Group	Engagement: Activities	3	Overall experience with activities				1-2		
Student Focus Group	Engagement: Activities	4	Benefits from participation in activities				1		
Student Focus Group	Engagement: Activities	5	Participation in activities led by STEM Club members	5.1,5.2					
Student Focus Group	Engagement: Activities	6	Participation in activities led by Peer Coaches	5.1,5.2					
Student Focus Group	Engagement: Activities	7	Recommendations about activities				6		
Student Focus Group	Engagement: Activities	8	Suggested activities				6		
Student Focus Group	STEM Academic Advising	9	Preliminary question to determine who should be asked question 10						
Student Focus Group	STEM Academic Advising	10a	Importance of STEM Advising	4.1-4.4					
Student Focus Group	STEM Academic Advising	10b	Suggestions for STEM Advising				6		
Student Focus Group	STEM Academic Advising	11	Not participated in STEM Advising				5-6		
Student Focus Group	Summer Bridge	12	Preliminary question to determine who should be asked questions 12a-c						
Student Focus Group	Summer Bridge	12a	Favorite Part				1		
Student Focus Group	Summer Bridge	12b	Beneficial Aspects				1		
Student Focus Group	Summer Bridge	12c	Suggestions				6		
Student Focus Group	STEM Professionalization Experiences	13	Preliminary question to determine if sub questions should be asked						
Student Focus Group	STEM Professionalization Experiences	13a	Overall Experience						1

Student Focus Group	STEM Professionalization Experiences	13b	Most Beneficial				1		1
Student Focus Group	STEM Professionalization Experiences	13c	Suggestions				6		
Student Focus Group	STEM Professionalization Experiences	13d	Suggest it for others?						1
Student Focus Group	STEM Professionalization Experiences	14	Preliminary question to determine if sub questions should be asked						
Student Focus Group	STEM Professionalization Experiences	14a	Overall Experience						1
Student Focus Group	STEM Professionalization Experiences	14b	Most Beneficial				1		1
Student Focus Group	STEM Professionalization Experiences	14c	Suggestions				6		
Student Focus Group	STEM Professionalization Experiences	14d	Suggest it for others?						1
Student Focus Group	STEM Professionalization Experiences	15	Preliminary question to determine if sub questions should be asked						
Student Focus Group	STEM Professionalization Experiences	15a	Overall Experience						1
Student Focus Group	STEM Professionalization Experiences	15b	Most Beneficial				1		1
Student Focus Group	STEM Professionalization Experiences	15c	Suggestions				6		
Student Focus Group	STEM Professionalization Experiences	15d	Suggest it for others?						1
Student Focus Group	STEM Professionalization Experiences	16	Decision to participate	10.1, 11.1, 12.1					

Student Focus Group	STEM Professionalization Experiences	17	Present at LSAMP Showcase	10.4, 11.3, 12.4					
Student Focus Group	STEM Professionalization Experiences	17a	Recommend continuation of LSAMP Showcase				6		
Student Focus Group	Overall Experience with the LSAMP Program	18	Have you learned more about STEM Careers and Pathways?	7.1					
Student Focus Group	Overall Experience with the LSAMP Program	18a	LSAMP leads to STEM Careers?						2
Student Focus Group	Overall Experience with the LSAMP Program	19	Do you feel like you belong in the STEM field?					8-10	
Student Focus Group	Overall Experience with the LSAMP Program	20	Anything else I should know?						
Project Staff Interview	Student Focused Activities	1ai	How are students recruited for Summer Bridge?	1.1					
Project Staff Interview	Student Focused Activities	1aii	What types of workshops and presentations were offered for Summer Bridge students?	1.2					
Project Staff Interview	Student Focused Activities	1aiii	What types of hands-on activities were offered to students?	1.4					
Project Staff Interview	Student Focused Activities	1aiv	What types of career pathway activities were offered to students?	1.5					
Project Staff Interview	Student Focused Activities	1av	How do students learn about institutional resources and tools during Summer Bridge?	1.6					
Project Staff Interview	Student Focused Activities	1avi	Tell me how summer bridge incorporates the UN Sustainable Development Goals.	1.7, 1.8					
Project Staff Interview	Student Focused Activities	2ai	Are math assessments used to help high school seniors determine their skill level?	2.1					
Project Staff Interview	Student Focused Activities	2aii	Do students meet with dedicated STEM advisors to discuss math course placement?	2.2					

Project Staff Interview	Student Focused Activities	2aiii	Are students able to earn math course waivers at your institution? What is required for a course waiver?	2.3					
Project Staff Interview	Student Focused Activities	3a	LSAMP students are supposed to be offered orientation. How does your institution provide orientation to students?	1.3, 3					
Project Staff Interview	Student Focused Activities	4ai	Was your institution able to hire a dedicated LSAMP STEM advisor?						
Project Staff Interview	Student Focused Activities	4aii	Do LSAMP STEM advisors help students establish educational plans and transfer plans?	4.1					
Project Staff Interview	Student Focused Activities	4aiii	Do LSAMP STEM advisors help students prepare for CFSA engagement opportunities?	4.2					
Project Staff Interview	Student Focused Activities	4aiv	Do LSAMP STEM advisors meet with students with retention concerns? How do they work with these students?	4.4					
Project Staff Interview	Student Focused Activities	5	Another aspect of the fidelity matrix is related to student-led STEM skill building and peer support. Can you tell me about the opportunities led by students at your institution?	5.1, 5.2, 6.1, 6.2					
Project Staff Interview	Student Focused Activities	5b	What successes have you experienced with students leading activities?				1		
Project Staff Interview	Student Focused Activities	5ci	What challenges have you experienced with students leading activities?				2		
Project Staff Interview	Student Focused Activities	5cii	What students lead activities (e.g., Peer Coaches, STEM club members)?	5.1, 5.2, 6.1, 6.2					
Project Staff Interview	Student Focused Activities	5ciii	How do you find students to lead activities?				1, 2		

Project Staff Interview	Student Focused Activities	5civ	How do students propose an activity to lead?				1, 2		
Project Staff Interview	Student Focused Activities	6	How does your institution help students to build their STEM identity?	7.1					
Project Staff Interview	Student Focused Activities	6a	What successes have you experienced with STEM identity activities?	7.1			1		
Project Staff Interview	Student Focused Activities	6b	What challenges have you experienced with STEM identity activities?	7.1			2		
Project Staff Interview	Student Focused Activities	6ci	Have you been able to hold STEM career events?	7.1					
Project Staff Interview	Student Focused Activities	6cii	Have you been able to hold STEM identity events?	7.1					
Project Staff Interview	Student Focused Activities	6ciii	Have you been able to hold STEM networking events?	7.1					
Project Staff Interview	Student Focused Activities	6civ	How does your institution support STEM community?	7.2					
Project Staff Interview	Student Focused Activities	6cv	Have you been able to work with STEM professionals to help provide events?	7.2					
Project Staff Interview	Student Focused Activities	7	Has your institution supported students in competing for national research and internship opportunities?	7.3					
Project Staff Interview	Student Focused Activities	8	Was STEM Summit held at your institution?	8.1					
Project Staff Interview	Student Focused Activities	9	Did students have the opportunity to attend college and industry tours?	9.1, 9.2					
Project Staff Interview	Student Focused Activities	10	Students have the opportunity to participate in STEM Professionalization Experiences (i.e., Research Scholars, Community Interns, Peer Coaches). Can you tell me what has happened with each of these experiences at your institution?	10.1-4, 11.1-3, 12.1-4					

Project Staff Interview	Student Focused Activities	10a	What successes have you experienced with STEM professionalization activities?				1		
Project Staff Interview	Student Focused Activities	10b	What challenges have you experienced with STEM professionalization activities?				2		
Project Staff Interview	Student Focused Activities	10c	Was an LSAMP Showcase held this year for students to present products from their experiences at?	10.4, 11.3, 12.4					
Project Staff Interview	Faculty Focused Activities	11	Can you tell me about workshops that have been offered to faculty/staff to support student engagement?		1.1				
Project Staff Interview	Faculty Focused Activities	12	Faculty can be involved in LSAMP as research mentors and through the Summer STEM Institute, STEM Clubs, and other LSAMP activities. How have faculty been involved at your institution?		2.1,2.2				
Project Staff Interview	Faculty Focused Activities	12a	What successes have you experienced with faculty involvement?				1		
Project Staff Interview	Faculty Focused Activities	12b	What challenges have you experienced with faculty involvement?				2		
Project Staff Interview	Faculty Focused Activities	13	Has your institution established institution-specific implementation teams? Can you please tell me about these teams?		3.2				
Project Staff Interview	Department/Institution Activities	14	One activity was to develop articulation agreements with expanded university partners. Can you please tell me about any actions that have occurred?			1.1			
Project Staff Interview	Department/Institution Activities	15	Clear STEM degree pathways are also intended to be developed with university partners. Can you			1.2			

			please tell me about any actions that have occurred?						
Project Staff Interview	Department/Institution Activities	16	Finally, data sharing agreements are to be developed with university partners. Can you please tell me about any actions that have occurred?			1.3			
Project Staff Interview	Department/Institution Activities	17	Has an assessment and evaluation group been developed? Can you please tell me what actions this group has taken?			2.1			
Project Staff Interview	Sustainability	18	In your opinion, what has been the biggest success with LSAMP this year?				1,5		
Project Staff Interview	Sustainability	19	What has been the biggest challenge with LSAMP this year?				2		
Project Staff Interview	Sustainability	19a	How have you worked to respond to those challenges?				2		
Project Staff Interview	Sustainability	20	What aspects of the grant are emerging as sustainable past the end of the grant period?				4		

LSAMP Faculty/Staff Focus Group Protocol

Thank you for taking time today to speak with us today about the LSAMP Central Florida STEM Alliance (CFSA) Paths project. The Central Florida STEM Alliance, composed of Valencia College, the College of Central Florida, Pasco-Hernando State College, and Polk State College, is implementing this initiative to support historically unrepresented minority students in STEM. The alliance received a grant from the National Science Foundation in 2021 to support this project.

My name is _____ and I am a member of Shaffer Evaluation Group, an independent educational evaluation firm commissioned by the alliance to gain a better understanding of the implementation and effectiveness of the LSAMP project. Today's focus group discussion is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP at the alliance institutions.

Your participation today is voluntary. You may skip questions or discontinue participation at any time. Please know that there is no "right" answer, and we encourage you to respond to each question. We deeply appreciate your time. Our conversation today will last no longer than one hour.

I am audio-recording today's discussion for the purpose of transcribing your comments for analysis. Please know that all responses will remain confidential. This means that your responses will only be shared with other members of the evaluation team, and we will ensure that any information we include in our report does not identify you as the respondent. You are free to withdraw from this discussion at any time without penalty.

Before we begin our conversation, I have some group norms that I am asking each of you observe:

1. First, please do not identify other people (students, faculty, or staff) by name when you talk. You might say instead, for example, "an LSAMP student," "a professor," or "a staff member."

2. Secondly, respect everyone's point of view. I don't expect you to agree with one another about everything, and there are no right or wrong answers to my questions. Everyone's contributions are valuable.

3. Because your comments are being recorded, I need one person to speak at a time. You do not have to raise your hand; just wait until the person who is speaking stops before you begin.

4. Finally, please do not repeat or discuss comments made during this session with others. Please do not repeat or discuss with other students/faculty/staff what members of your group may say. If you are asked, you may say that the group talked about ways to improve the LSAMP program, but please keep specific remarks confidential.

This session will last about 60 minutes. Did you have any questions for me before we begin?

1. Can you please introduce yourself and tell me your role at [Institution] and how you are involved with the LSAMP Program?

STEM Professionalization Experiences

1. Thank you for sharing your involvement with me. I'd like to ask those of you that participate as research mentors about your experience in that role. First, how has your overall experience as a research mentor been?

2. What are the benefits of participation as Research Scholars for students? How do you know?

3. As part of the Research Scholars program, students participate in 40 hours of research. Have your students been successfully able to complete this requirement?

4. Are there any improvements that should be made to the Research Scholar program?

5. As you may know, students can also participate as Community Interns or Peer Coaches. Is anyone here involved with those programs? [If any faculty/staff are involved, direct the following questions to those faculty/staff members]

    a. How have you been involved?

    b. What do you see as the benefits of participation in that program for students? How do you know?

    c. Are there any improvements that need to made to the program?

Student Activities

6. To remain an active LSAMP member, students are required to participate in 3 activities per semester. There are a variety of options for students to participate in. Has anyone been involved with these activities?

7. What is overall opinion of the activities you've been involved in?

8. Do you think these activities are beneficial for students?

9. Do you have any recommendations about the activities that you have been involved in?

10. Are there any activities that you would like to see offered to LSAMP students?

Participation in CFSA Work Groups/Implementation Teams

11. Is anyone here involved in any of the CFSA work groups? If so, how has your experience been?

    a. How frequently have you met or been in communication with your work group?

    b. What are some of the successes and challenges you've experienced as part of this work group?

12. Is anyone here involved in a campus-specific implementation team? If so, how has your experience been?

    a. How frequently have you met or been in communication with the team?

    b. What are some of the successes and challenges you've experienced as part of this team?

Sustainability

13. What aspects of LSAMP do you think will be sustained after grant funding ends?

14. What has been your overall impression of the LSAMP Program at your institution?

    a. In your opinion, what works in LSAMP?

    b. What does not work in LSAMP?

    c. What recommendations would you make to the project staff about the LSAMP Program at your institution?

LSAMP Student Focus Group Protocol

Thank you for taking time today to speak with us today about the LSAMP Central Florida STEM Alliance (CFSA) Paths project. The Central Florida STEM Alliance, composed of Valencia College, the College of Central Florida, Pasco-Hernando State College, and Polk State College, is implementing this initiative to support historically unrepresented minority students in STEM. The alliance received a grant from the National Science Foundation in 2021 to support this project.

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8. Finally, please do not repeat or discuss comments made during this session with others. Please do not repeat or discuss with other students/faculty/staff what members of your group may say. If you are asked, you may say that the group talked about ways to improve the LSAMP program, but please keep specific remarks confidential.

This session will last about 60 minutes. Did you have any questions for me before we begin?

The LSAMP Program

2. How did you hear about the LSAMP program?

3. What made you decide to apply to become an LSAMP member?

Engagement: Activities

To remain an active LSAMP member, you are required to participate in 3 activities per semester. I would like to talk about your experiences with the activities you've participated in.

4. How has your experience been with LSAMP activities overall?

    a. Probe for: formal activities, informal activities, college/industry tours, STEM Conferences

5. Has participating in the activities been beneficial for you in any way? If so, please explain.

    a. Probe for: interest in STEM careers; sense of belonging; STEM self-efficacy; STEM identity

6. Have you participated in any activities led by STEM club members? How was your experience with these activities?

7. [Starting in Year 2] Have you participated in any activities led by peer coaches? How was your experience with these activities?

8. Do you have any recommendations about the activities that you have participated in?

9. Are there any activities that you would like to see offered to LSAMP students?

STEM Academic Advising

10. I would now like to talk to you about STEM academic advising. Have any of you participated in STEM advising this year?

11. If you have participated in STEM advising, what has your experience been like?

    a. Do you think having a dedicated STEM advisor is important for LSAMP students?

    b. Do you have any suggestions about STEM advising?

12. If you have not participated in STEM advising, can you tell me why you haven't?

    a. Probe for: knowledge of STEM advisor; knowledge of STEM advising; time; need for STEM advising

Summer Bridge [Starting in Year 2]

13. The next set of questions I'd like to direct to anyone who participated in the Summer Bridge experience for incoming students. Did anyone participate in Summer Bridge? [If any students have participated, direct the following questions to those students]

a. Tell me about your experience with the Summer Bridge experience. What was your favorite part of participating in the Summer Bridge experience? *This could be people, activities, experiences, or other aspects.*

b. What activities during the Summer Bridge were most beneficial for you?

c. What suggestions would you provide to improve the Summer Bridge experience?

STEM Professionalization Experiences [Starting in Year 2]

14. Has anyone here been a LSAMP Research Scholar? [If any students have participated, direct the following questions to those students]

    a. How was your experience as an LSAMP Research Scholar?

    b. What parts of being a Research Scholar were most beneficial for you?

    c. What suggestions would you provide to improve the Research Scholar experience?

    d. Would you suggest other LSAMP members participate as an LSAMP Research Scholar?

15. Has anyone here been a LSAMP Community Intern? [If any students have participated, direct the following questions to those students]

    a. How was your experience as an LSAMP Community Intern?

    b. What parts of being a Community Intern were most beneficial for you?

    c. What suggestions would you provide to improve the Community Intern experience?

    d. Would you suggest other LSAMP members participate as an LSAMP Community Intern?

16. Has anyone here been a LSAMP Peer Coach? [If any students have participated, direct the following questions to those students]

    a. How was your experience as an LSAMP Peer Coach?

    b. What parts of being a Peer Coach were most beneficial for you?

    c. What suggestions would you provide to improve the Peer Coach experience?

    d. Would you suggest other LSAMP members participate as an LSAMP Peer Coach?

17. Why did you decide to participate in one of these programs (Research Scholar, Peer Coach, Community Intern)?

    a. Probe for financial incentive.

18. These programs (Research Scholar, Peer Coach, Community Intern) include presentations at the LSAMP Showcase. Did you present at the LSAMP Showcase? If so, how was your experience?

    a. Would you recommend this continue to be a requirement of these programs? Why or why not?

Overall Experience with the LSAMP Program

19. Through your participation in LSAMP, have you learned more about STEM Careers and pathways?

    a. Has participation helped anyone decide on a career or pathway?

20. One goal of participation in LSAMP is to increase students' sense of STEM identity and sense of belonging in STEM. Do you feel like you belong in the STEM field? Why or why not?

21. Today we've talked about many different activities and aspects of LSAMP. What has been the most significant change for you based on participating in LSAMP?

22. Is there anything else I should know?

LSAMP Project Staff Focus Group Protocol

Thank you for taking time today to speak with me today about the LSAMP Central Florida STEM Alliance (CFSA) Paths project. The Central Florida STEM Alliance, composed of Valencia College, the College of Central Florida, Pasco-Hernando State College, and Polk State College, is implementing this initiative to support historically unrepresented minority students in STEM. The alliance received a grant from the National Science Foundation in 2021 to support this project.

My name is _____ and I am a member of Shaffer Evaluation Group, an independent educational evaluation firm commissioned by the alliance to gain a better understanding of the implementation and effectiveness of the LSAMP project. Today's focus group discussion is part of a comprehensive evaluation, the results of which will be used to make recommendations regarding the future of the LSAMP at the alliance institutions.

Your participation today is voluntary. You may skip questions or discontinue participation at any time. Please know that there is no "right" answer, and we encourage you to respond to each question. We deeply appreciate your time. Our conversation today will last no longer than one hour.

I am audio-recording today's discussion for the purpose of transcribing your comments for analysis. Please know that all responses will remain confidential. This means that your responses will only be shared with other members of the evaluation team, and we will ensure that any information we include in our report does not identify you as the respondent. You are free to withdraw from this discussion at any time without penalty.

Before we begin our conversation, I have some group norms that I am asking each of you observe:

9. First, please do not identify other people (students, faculty, or staff) by name when you talk. You might say instead, for example, "an LSAMP student," "a professor," or "a staff member."

10. Secondly, respect everyone's point of view. I don't expect you to agree with one another about everything, and there are no right or wrong answers to my questions. Everyone's contributions are valuable.

11. Because your comments are being recorded, I need one person to speak at a time. You do not have to raise your hand; just wait until the person who is speaking stops before you begin.

12. Finally, please do not repeat or discuss comments made during this session with others. Please do not repeat or discuss with other students/faculty/staff what members of your group may say. If you are asked, you may say that the group talked about ways to improve the LSAMP program, but please keep specific remarks confidential.

This session will last about an hour and a half. Did you have any questions for me before we begin?

23. Can you please introduce yourself and tell me your role at [Institution] and how you are involved with the LSAMP Program?

Thank you. I'm going to go through each aspect of the fidelity matrices so we can discuss the progress that has happened with each.

Student Focused Activities

1. [Beginning in Year 2] The first activity is the Summer Bridge experience for incoming college students. Can you tell me what actions have occurred with this activity this year?
    a. Probe as necessary:
        i. How are students recruited for Summer Bridge?
        ii. What types of workshops and presentations were offered for Summer Bridge students?
        iii. What types of hands-on activities were offered to students?
        iv. What types of career pathway activities were offered to students?
        v. How do students learn about institutional resources and tools during Summer Bridge?
        vi. Tell me how summer bridge incorporates the UN Sustainable Development Goals.
2. One goal with LSAMP is that students are supported to ensure appropriate math course placement. Can you tell me what actions occur at your institution to support students with math course placement?
    a. Probe as necessary:
        i. Are math assessments used to help high school seniors determine their skill level?
        ii. Do students meet with dedicated STEM advisors to discuss math course placement?
        iii. Are students able to earn math course waivers at your institution? What is required for a course waiver?
3. LSAMP students are supposed to be offered orientation. How does your institution provide orientation to students?
    a. Probe for summer bridge and dedicated orientations offered at other times
4. LSAMP students should have access to dedicated STEM advising. Can you tell me how this works at your institution?

a. Probe as necessary:

    i. Was your institution able to hire a dedicated LSAMP STEM advisor?

    ii. Do LSAMP STEM advisors help students establish educational plans and transfer plans?

    iii. Do LSAMP STEM advisors help students prepare for CFSA engagement opportunities?

    iv. Do LSAMP STEM advisors meet with students with retention concerns? How do they work with these students?

5. Another aspect of the fidelity matrix is related to student-led STEM skill building and peer support. Can you tell me about the opportunities led by students at your institution?

    a. What successes have you experienced with students leading activities?

    b. What challenges have you experienced with students leading activities?

    c. Probe as necessary:

        i. What students lead activities (e.g., Peer Coaches, STEM club members)?

        ii. How do you find students to lead activities?

        iii. How do students propose an activity to lead?

        iv. Are students leading a wide enough variety of activities (e.g., study session, tutoring, informal support sessions, STEM skill building workshops)?

6. How does your institution help students to build their STEM identity?

    a. What successes have you experienced with STEM identity activities?

    b. What challenges have you experienced with STEM identity activities?

    c. Probe as necessary:

        i. Have you been able to hold STEM career events?

        ii. Have you been able to hold STEM identity events?

        iii. Have you been able to hold STEM networking events?

        iv. How does your institution support STEM community?

        v. Have you been able to work with STEM professionals to help provide events?

7. Has your institution supported students in competing for national research and internship opportunities?

8. Was STEM Summit held at your institution?

9. Did students have the opportunity to attend college and industry tours?

10. [Beginning in Year 2] Students have the opportunity to participate in STEM Professionalization Experiences (i.e., Research Scholars, Community Interns, Peer Coaches). Can you tell me what has happened with each of these experiences at your institution?

    a. What successes have you experienced with STEM professionalization activities?

    b. What challenges have you experienced with STEM professionalization activities?

    c. Was an LSAMP Showcase held this year for students to present products from their experiences at?

Faculty Focused Activities

11. Now I would like to talk about faculty/staff activities. Can you tell me about workshops that have been offered to faculty/staff to support student engagement?

12. Faculty can be involved in LSAMP as research mentors and through the Summer STEM Institute, STEM Clubs, and other LSAMP activities. How have faculty been involved at your institution?

    a. What successes have you experienced with faculty involvement?

    b. What challenges have you experienced with faculty involvement?

13. Has your institution established institution-specific implementation teams? Can you please tell me about these teams?

Department/Institution Activities

14. I now want to talk about STEM Pathways. One activity was to develop articulation agreements with expanded university partners. Can you please tell me about any actions that have occurred?

15. Clear STEM degree pathways are also intended to be developed with university partners. Can you please tell me about any actions that have occurred?

16. Finally, data sharing agreements are to be developed with university partners. Can you please tell me about any actions that have occurred?

17. Has an assessment and evaluation group been developed? Can you please tell me what actions this group has taken?

Sustainability

18. In your opinion, what has been the biggest success with LSAMP this year?

19. What has been the biggest challenge with LSAMP this year?

    a. How have you worked to respond to those challenges?

20. What aspects of the grant are emerging as sustainable past the end of the grant period?

APPENDIX C: RECOGNIZED STEM MAJORS

NSF/LSAMP STEM Classification of Instructional Programs

Agricultural Sciences (AgriSci)
01.09 Animal Sciences
01.10 Food Science and Technology
01.11 Plant Sciences
01.12 Soil Sciences
01.99 Agriculture, Agriculture Operations and Related Sciences, Other

Natural Resources and Conservation (NatRes)
03.01 Natural Resources Conservation and Research
03.02 Natural Resources Management and Policy
03.03 Fishing and Fisheries Sciences and Management
03.05 Forestry
03.06 Wildlife and Wildlands Science and Management
03.99 Natural Resources and Conservation, Other

Architecture (Arch)
04.02 Architecture
04.04 Environmental Design
04.09 Architectural Sciences and Technology

Computer and Information Sciences (CmpSci)
11.01 Computer and Information Sciences, General
11.02 Computer Programming
11.04 Information Science/Studies
11.07 Computer Science
11.08 Computer Software and Media Applications

Engineering (EngUnc)
14.01 Engineering, General
14.02 Aerospace, Aeronautical and Astronautical Engineering
14.03 Agricultural Engineering
14.04 Architectural Engineering
14.06 Ceramic Sciences and Engineering
14.07 Chemical Engineering
14.08 Civil Engineering
14.09 Computer Engineering
14.10 Electrical, Electronics and Communications Engineering
14.11 Engineering Mechanics
14.12 Engineering Physics
14.13 Engineering Science
14.14 Environmental/Environmental Health Engineering
14.18 Materials Engineering
14.19 Mechanical Engineering
14.20 Metallurgical Engineering
14.21 Mining and Mineral Engineering
14.22 Naval Architecture and Marine Engineering

14.23 Nuclear Engineering
14.24 Ocean Engineering
14.25 Petroleum Engineering
14.27 Systems Engineering
14.28 Textile Sciences and Engineering
14.32 Polymer/Plastics Engineering
14.33 Construction Engineering
14.35 Industrial Engineering
14.36 Manufacturing Engineering
14.37 Operations Research
14.38 Surveying Engineering
14.39 Geological/Geophysical Engineering
14.40 Paper Science and Engineering
14.41 Electromechanical Engineering
14.42 Mechatronics, Robotics, and Automation Engineering.
14.43 Biochemical Engineering
14.44 Engineering Chemistry
14.45 Biological/Biosystems Engineering
14.99 Engineering, Other

Engineering Technologies (EngTech)
15.00 Engineering Technology, General
15.10 Construction Engineering Technologies
15.11 Engineering-Related Technologies
15.15 Engineering-Related Fields
15.16 Nanotechnology

Biological Sciences (Bio)
26.01 Biology, General
26.02 Biochemistry, Biophysics and Molecular Biology
26.03 Botany/Plant Biology
26.04 Cell/Cellular Biology and Anatomical Sciences
26.05 Microbiological Sciences and Immunology
26.07 Zoology/Animal Biology
26.08 Genetics
26.09 Physiology, Pathology and Related Sciences
26.11 Biomathematics, Bioinformatics, and Computational Biology
26.12 Biotechnology
26.13 Ecology, Evolution, Systematics, and Population Biology
26.15 Neurobiology and Neurosciences
26.99 Biological and Biomedical Sciences, Other

Mathematics (Math)
27.01 Mathematics
27.03 Applied Mathematics
27.05 Statistics
27.99 Mathematics and Statistics, Other

Interdisciplinary Studies (InterDisc)
30.01 Biological and Physical Sciences

30.06 Systems Science and Theory
30.08 Mathematics and Computer Science
30.10 Biopsychology
30.18 Natural Sciences
30.19 Nutrition Sciences
30.27 Human Biology
30.30 Computational Science
30.32 Marine Sciences

Physical Sciences (PhysSci)
40.01 Physical Sciences
40.02 Astronomy and Astrophysics
40.04 Atmospheric Sciences and Meteorology
40.05 Chemistry
40.06 Geological and Earth Sciences/Geosciences
40.08 Physics
40.10 Materials Science
40.99 Physical Sciences, Other

Business and Management (BusMgt)
52.13 Management Sciences and Quantitative Methods, Other

APPENDIX D: IRB APPLICATION

Please note, IRB applications for Valencia and Central Florida are presented in Appendix D. Polk and Pasco-Hernando will be covered under Valencia's IRB.

Valencia Application

Valencia IRB Mock-Up

Title of your study	Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement
Your first name	
Your last name	
Your current position / title Department / program	
Mail Code (if applicable)	
Campus (if applicable)	
Phone	
Address first line	
Address second line	
City	
State	
Zip code	

Start Date:

Month	01
Day	03
Year	2022

End Date:

Month	01
Day	21
Year	2024

Which best describes you? Valencia employee

Have you read application overview? Yes

External Connections

Dissertation or thesis? No

Funding:

External – National Science Foundation Louis Stokes Alliances for Minority Participation: Bridges to Baccalaureate (NSF LSAMP B2B)

Will individuals outside Valencia be collaborating? Yes

List info:

First Name: Allan

Last Name: Danuff

Organization: College of Central Florida

Title/Role: Associate Vice President, Arts and Sciences

Email: danuffa@cf.edu

Please describe role: Dr. Danuff is a Co-PI of the NSF LSAMP project located at College of Central Florida.

First Name: Reggie

Last Name: Webb

Organization: Polk State College

Title/Role: Vice President for Student Services

Email: rwebb@polk.edu

Please describe role: Mr. Webb is a Co-PI of the NSF LSAMP project located at Polk State College.

First Name: Gerene

Last Name: Thompson

Organization: Pasco-Hernando State College

Title/Role: Dean of Arts and Sciences

Email: thompsg@PHSC.edu

Please describe role: Dr. Thompson is a Co-PI of the NSF LSAMP project located at Pasco-Hernando State College.

First Name: Patricia M.

Last Name: Shaffer

Organization: Shaffer Evaluation Group

Title/Role: External Evaluator

Email: patricia.shaffer@shafferevaluation.com

Please describe role: Dr. Shaffer is responsible for oversight of the evaluation study, including data collection, analysis, and reporting.

First Name: Stacy

Last Name: Hayden

Organization: Shaffer Evaluation Group

Title/Role: External Evaluator

Email: stacy@shafferevaluation.com

Please describe role: Ms. Hayden is responsible for data collection, analysis, and reporting.

Human Protections

PI Lead Researcher

Training that is less than 3 years old: CITI Harvard's PHRP or Other

Will you share responsibilities with Co-PI (s)?

CO-PI Second Lead Researcher

Training that is less than 3 years old: CITI Harvard's PHRP or Other

Name and affiliation of this person:

First

Last

Title/Role

Organization/Department. Office

Email (this application will be shared to this address)

Research Methodology

Design

The purpose of this study is to conduct an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). The evaluation will be conducted as a mixed methods study including both qualitative and quantitative measures. This study is guided by a series of research questions that assess the impacts on participating students, including early exposure to STEM pathways, careers and STEM-related concepts, experiences to foster students' science identities, application of STEM knowledge, participation in and completion of STEM research and internship experiences, and efficacy in ability to do college-level work (particularly but not exclusively in math courses) and intent to transfer after associates degree to a Transfer Pathways Partner school or other four year university program.

The study design includes (a) process evaluation to monitor implementation and provide feedback that goes beyond forming short-term solutions as well as (b) outcome/effectiveness evaluation to determine progress in the intended outcomes of the project. The process evaluation monitors activity-level (e.g., Summer Bridge, advising, student-led STEM skill-building) indicators, ultimately using these to determine correlations to short-term student outcomes (e.g., student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate). The outcome/effectiveness evaluation includes 10 strategic indicators across two goals. Several indicators will be used for a quasi-experimental design study utilizing a comparison group to assess the program's impact on student mid- and long-term outcomes.

Process Evaluation

Guiding evaluation questions for monitoring CFSA fidelity of implementation are:

a. To what extent were the key components of the CFSA Paths Activity Framework implemented with fidelity?
b. What was the amount of variation in implementation fidelity?
c. What was the relationship of fidelity of implementation to short-term outcomes associated with student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate?

Outcome/Effectiveness Evaluation

Design

An outcome study will be conducted in the final year of the project. This outcome study will utilize a quasi-experimental design (QED) to establish a cause-and-effect relationship between engagement with the LSAMP program and several indicators:

- SI.2 Increase in LSAMP URMs who maintain a GPA of 2.75 or higher;
- SI.3 Increased retention and persistence rates compared to prior grant years and non-LSAMP URM STEM students;
- SI.6 Increase in LSAMP URM student graduation rates;
- SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4 year baccalaureate programs.

The design is a nonequivalent groups design. In a nonequivalent groups design, it is expected that groups are not similar as they have not been randomly assigned but are being determined based on participation levels in LSAMP.

Groups will be determined based on engagement with the LSAMP program. Exploratory analysis will be conducted after Year 1 to refine to determine if grouping criteria for LSAMP activity participation is appropriate or if it needs to be modified. Three groups will be formed:

- Low Engagement: Students who complete the minimum requirements to remain an LSAMP member. Specifically:
    - Participation in 3 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) per semester; and
    - Meets with STEM advisor 1 time per semester.
- Medium Engagement: Students who demonstrate additional engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or more frequent participation in LSAMP experiences. Specifically:
    - Participation in 4-7 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and
    - Meets with STEM advisor 1 or more times per semester.
- High Engagement: Students who demonstrate significant engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or very frequent participation in LSAMP experiences. Specifically:
    - Participation in 8 or more LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and

- Meets with STEM advisor 1 or more times per semester.

Procedures for Data Collection

This evaluation uses a mixed methods approach and will produce data that is both qualitative and quantitative in nature. Mixed methods increase the validity of studies, allow for triangulation strategies, and provide a more complete answer to evaluation questions. The evaluation framework, strategic indicators, fidelity of implementation matrices, and process monitoring matrices provide information about how data on indicators will be collected. As indicators in these documents span several program activities and data types, several tools have been developed to streamline data collection. Additionally, extant data will be collected from each of the four partner institutions on LSAMP students to include:

1. Unique identifiers for all students (with student proxy id generated by the higher ed institution)
2. Higher education institution in which student enrolled
3. Composite demographic information of all LSAMP members
4. Degree Seeking Status
5. Education Plan Designation
6. Cumulative GPA
7. Graduation records
8. Transfer application information

Virtual (Year 1) and in-person (Years 2-3) data collection includes focus group discussions with students and faculty/staff from all four CFSA partner institutions participating in the program. The researcher will conduct a site visit (virtual in year 1, in-person in year 2 and 3) to each of the four CFSA partner institutions at the time of an LSAMP event or program and will meet with focus group participants at Central Florida State College, Pasco-Hernando State College, Polk State College, and Valencia College. During focus group discussions, data will be collected via means of facilitated discussion using a written consent protocol and a semi-structured discussion protocol with discussion topics, questions, and probes. Participants will be invited by email approximately two weeks in advance of the focus group discussion; the email will include an attached consent form that includes study information and informed consent language. The consent form will be distributed in person at the focus group to ensure that all participants read and complete the form prior to participating in focus group discussions.

Survey data collection will be conducted using an online survey platform (Qualtrics) using the evaluator's account. Students and partner institution staff will be briefed about the survey via email and provided the opportunity to ask questions about this data collection. Following this briefing, the participant will be sent an email invitation from the researcher along with a consent form that includes study information, utilizes informed consent language, and provides a unique link to the survey. The first page of the survey will reiterate the informed consent language and require response to a single question that provides consent to participate in the survey. If the participant selects "no" the participant will not be provided access to the survey.

Feedback forms will also be collected from participants at the completion of specific LSAMP activities. Forms are anonymous and responses will be reported in aggregate for each activity.

The following section details data collection tools and how they are used. Copies of all instruments and data collection tools are included in the evaluation plan.

- Detailed Implementation Report: The detailed implementation report will be filled out by Project Leads (i.e., the faculty/staff member responsible for the project) and verified by SEG (i.e., the external evaluator). This report aligned with the fidelity matrices (see attached Evaluation Plan), each indicator is accompanied by a question on the detailed implementation report. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. An extra column is provided for liaisons to include if they will be providing additional data sources. This form is filled out once per term (i.e., Fall, Spring, Summer).

- Strategic Indicators Report: The strategic indicators report will be filled out by Project Leads and verified by SEG. This report is aligned with the strategic indicators. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. This form is filled out once per year (i.e., the end of the Summer term).

- Advising Log: The advising log will be filled out by advisors and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Advisors report on advising activities (e.g., meeting dates, topics) by student. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Engagement Opportunity Log: The Engagement Opportunity Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on engagement opportunities offered to LSAMP Students including date, leader, role of leader, modality, number of attendees, and if an attendee roster will be provided. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Faculty Log: The faculty log will be filled out by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project Leads list all possible faculty participants and record faculty participation in activities (i.e., research mentor, working group, implementation team). Faculty name can be replaced with a unique identifier. This form is updated and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- STEM Professionalization Log: The STEM Professionalization Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on STEM professionalization participation (i.e., research scholar, community intern, peer coach).

This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Student Activity Log: The Student Activity Log will be filled out by project staff and verified by the Project lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on student participation in Summer Bridge, orientation, and This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

Following the approval of the evaluation plan, identification of a comparison group, and testing and refinement of data collection instruments, the external evaluator will proceed with data collection across all project years.

Plans for confidentiality, limited data access, and data disposition:

Data Anonymity/Confidentiality:

At the beginning of surveys and all qualitative data collection, participants will receive written, and for focus groups, verbal assurance that their participation is voluntary, that they can opt out at any time, that their responses will not be reported individually, and that their responses will never be linked to their individual responses. Researchers will combine all participant responses and report them in aggregate form only.

Surveys will not collect any personally identifying information (PII) - such as name of respondents – that could permit disclosure or identification of respondents, directly or by inference. All surveys will be collected online using Qualtrics using the “anonymous response” feature to avoid storing identifiable information such as geo-location or IP addresses. The “anonymous response” setting is compatible with email communication. When both of these features are used together, the online platforms will track which contacts have not yet completed the survey and will send any reminders set up to these contacts, but the researchers will have no visibility to this process and will not be able to tie survey responses to specific email addresses. Data for subgroups with cell sizes lower than 5 will be redacted or suppressed.

For focus group discussions, names will not be asked, and the focus group facilitator will not be provided the names of participants in advance. Audio recordings will be destroyed immediately upon transcription, and the transcriptions will be reviewed to remove any PII prior to analysis.

Limited Access:

Protecting the confidentiality of sensitive data is a priority of the research team. Researchers who are responsible for data collection, analysis, and reporting follows procedures and safeguards that limit access to data to other researchers on her team that are working on this project. Data that are collected by and/or data submitted to the external evaluator are stored in a cloud-based, password protected folder accessible only to assigned analysts. Computers are password protected.

Data Disposition:

Upon completion of the project, the research team will ensure the secure destruction of all data originally provided or collected, employing digital or physical shredding of electronic or physical data.

Privacy of Personal Data and Reuse of Anonymized Data by Others: The Central Florida STEM Alliance (CFSA) colleges' have policies in place for privacy protections that will be extended to those accessing the project data. All student, faculty, and staff data will be stripped of identifiers and only the PI and Co-PIs will have the identifier key. Colleges have ensured security procedures are followed with increased level of protection through password protected intranet and hardware storage. Personal data confidentiality is upheld and any data reported or presented will preserve the anonymity of students, faculty, and staff by not revealing identifying characteristics and with the exception of interviews or other data collection procedures within which the participant consents to and authorizes use of their name, voice, photograph, or written words. Colleges offer protection for those involved in the work from any claim that their "intellectual property" harmed a population or misrepresented information, while simultaneously allowing the shared use of the property on a broad scale.

Types of Data, Metadata, and Resources: CFSA Colleges' student information systems will be used to determine baseline data and track and collect data elements for reporting and program improvement analysis. Underrepresented minority students (URM) will be identified. For this project, these students will include African American, Hispanic, Native American, Alaskan Native, Native Hawaiian, and Native Pacific Islander students. Student data elements that will be collected include: student demographics (gender, race/ethnicity), performance, and academic program enrollment and transfer information. Consistent collection of data will allow for the dissemination of accurate and consistent information across the CFSA. Student records are maintained through database management and kept in secure online platform. Data captured is both quantitative (numbers declaring a STEM major, fall-to-fall and fall to spring retention and persistence rates; GPA; and others) and
Qualitative (student interaction with STEM faculty and project support staff; observations of student success through project, exit surveys, post-graduation/alumni surveys). The project team is especially interested in the collection of data on underrepresented minority students to measure sense of belonging, self-efficacy, and development of a STEM identity, as well as the correlation between STEM and social justice (STEMJ) and motivation to persist in STEM pathways. The PI and Co-PI, in collaboration with the college's data collection systems and the external evaluator, will use quantitative and qualitative analytics and application data collected to measure success of the project's outcomes including recruitment and student success strategies.

University partners will provide customized reports on the tracking of URM STEM graduates from the CFSA colleges so that progress will be measured in enrollment at the university, progression in STEM majors and for those who graduate. The Offices of Institutional Research at the expanded university partners will also support data sharing in agreements outlining these activities finalized during the project period. The data gathered can be disaggregated by major, ethnicity, and gender so that additional success strategies can be identified and implemented as needed to improve success of specific student subgroups.

Data Format: Standards for data management and access are administered by the CFSA Offices of Information Technology supporting high quality, progressive academic learning environments including learning technology and alternative delivery. Working collaboratively with these offices are staff members involved in institutional research which provides a secure venue for actively managing college-wide data. The purpose of this function is to contribute

data, information, and analysis to the CFSA colleges' culture of inquiry and evidence in support of learning assessment, decision-making, strategic planning, continuous improvement, and mandatory reporting.

The CFSA colleges utilize software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using shared transfer protocols including wide and local area networks, the Colleges use an enterprise-based intranet where folders and files are shared. Research staff access the data from the Colleges' student information system to create reports and assist the college staff with complex, ongoing research projects and data analysis using various file formats.

Ultimately, these outputs are designed to provide an electronic resource for both internal and external stakeholders. Numerous documents are available that includes aggregated data analyses of success measures relevant to the college communities. Metadata is also embedded in HTML documents on the Colleges' websites.

Policies for Access, Sharing, and Provisions for Appropriate Protection/Privacy: The CFSA Colleges have numerous policies adopted by their respective Boards of Trustees. Policies include those related to the acceptable use of information technology resources which identifies user's rights and responsibilities including liability, privacy and security, and consequences for violations as well as the Colleges' rights and responsibilities including user IDs and passwords, use of information/data, and use of software and hardware. At the CFSA Colleges, other relevant policies may include Academic Freedom, Research by Faculty, Copyright, Information Technology Resources, Computer Hardware and Software, Online Privacy, Access and Security, Student Records, Financial Information Security, Human Resource Record Information, Preservation and Disposal of Records, Notification of Social Security Number Collection and Usage, and Web Standards. Faculty and staff training on held periodically on policies.

CFSA Colleges also follow Family Educational Rights and Privacy Act (FERPA) guidelines, as well as participating in the Institutional Review Board (IRB) process. Under this grant program, deliverables will be made available as Open Educational Resources (OER) such as teaching and learning materials that others may freely use and reuse, without charge.

Policies for Archiving Data, Samples, and Other Research Products for Preservation: The CFSA Colleges have policies on the Preservation and Disposal of Records that includes reference to photographs or microphotographs. Although there is no official policy for maintaining data management and access of supporting documentation for work conducted by faculty or staff, any work performed by the project investigators or other personnel under the NSF grant project will be maintained in a data repository in a secure environment that will be organized appropriately to facilitate adequate search protocols for the legacy data, supported by both digital identification and archived for preservation. In the event project faculty or staff exits the CFSA Colleges, the data, samples, and other research products will be secured and preserved. The lineage of a digital object will be documented. The CFSA will explore archiving and preservation frameworks to determine the most compatible system for the project. This archive and project records will be retained for a reasonable length of time and will follow NSF guidelines. If applicable, open source standards will be made available, describing in detail the capture of data and the collection of meaningful assessment. The project team will make the numbers used for graphs or tables available for others to recreate in comparison of their own data. Primary data will be shared with other researchers. A blind copy of primary student measures will be made available to researchers who are encouraged to include in meta

research or who are conducting sets, for example, when a demographic variable is assigned to five or fewer students in the sample they would be removed.

Specifically what will be done with or to the research participants:

Participants will participate in the CFSA activities outlined below -

Central Florida STEM Alliance Activities: Student Focused Activities

LSAMP Focus: Summer Bridge Program

Summer Bridge Experience for Incoming College Students: Graduating high school seniors and first time in college students will participate in a summer bridge program experience - the Summer STEM Institute – which will include workshops and presentations by STEM professionals and college/university faculty. The program will utilize technology to offer a virtual or hybrid summer bridge experience for alliance-wide student engagement and promote equitable access for all students to participate in a summer experience. Through the program, students will engage in hands-on STEM activities, learn about STEM career pathways, and discover resources and tools available to them at their institutions to support their college readiness and success. Students will further explore the connections between STEM & societal challenges by learning about the UN Sustainable Development Goals (UN-SDGs) and developing projects that support attainment of the UN SDGs in their local communities.

Appropriate math course placement: Graduating high school seniors participating in the Summer STEM Institute will be required to complete a mathematics assessment to determine their appropriate math skill level. Such assessment may include taking the mathematics portion of Florida's Postsecondary Education Readiness Test (P.E.R.T.), submitting ACT or SAT scores, or other institutional-specific assessments utilized by CFSA partners for math course placement. All participants must meet with a dedicated STEM advisor as well in order to discuss their appropriate math course placement. Where possible, CFSA colleges may utilize institutional resources to provide a math course waiver to students who successfully complete all requirements of the Summer STEM Institute, including specific math advising and completion of necessary standardized test/assessments. This incentive will encourage students to accelerate progress toward completion of the math sequence with a right start in the first course.

LSAMP Focus: Student Recruitment & Engagement

LSAMP Student Recruitment & Focused Engagement: CFSA Paths will implement a strategy to recruit and engage all new LSAMP students in workshops and learning opportunities that foster their STEM socialization, professionalization and academic success. All students new to LSAMP will participate in an orientation – either through the summer STEM institute bridge program or through a dedicated orientation offered during the summer, fall and spring semesters. In order to join LSAMP, students must be enrolled at their CFSA institution, and registered as a degree-seeking student with demonstrated intent to major in STEM (non-health sciences). Preference will be given to URM students to ensure that at least 90% of all LSAMP students belong to racially and ethnically minoritized groups. All general LSAMP students will be assigned a designated STEM Advisor. Upon completing orientation and enrollment, students will gain access to participate in LSAMP activities, workshops, field trips and learning experiences. To remain engaged in LSAMP, all LSAMP participants will meet with their advisor

at least once and participate in at least 3 LSAMP experiences per enrolled semester. Such experiences might include participation in the STEM summit, peer-led student workshops, presentations led by STEM professionals, college tours, or other learning experiences.

LSAMP Focus: Dedicated STEM Academic Advising

STEM Pathways Advising: In alignment with the advising models at their institutions, dedicated STEM advisors will engage LSAMP students in a) academic planning including establishing an educational plan and transfer plan, b) identifying and preparing for CFSA engagement opportunities, c) referrals to other departments; d) responding to retention concerns.

LSAMP Focus: Student-led STEM Skill Building & Peer Support

Student-led STEM skill-building workshops and peer supports: LSAMP students, including Peer Coaches and STEM club members, will lead presentations and engagement opportunities for other LSAMP students and the broader STEM community at their institutions. These workshops will be developed and facilitated for students by students and may include a range of topics such as guidance for engaging in undergraduate research, exploration of STEM & social justice issues, resume building advice, or student perspectives on summer REUs. To support student socialization, as well as community building and cultivation of a sense of belonging among URM STEM students, Peer Coaches and STEM club members will facilitate informal support sessions for peers to connect with one another and discuss personal and academic achievements and challenges. Technology will be leveraged as possible to create opportunities for LSAMP students to engage across CFSA institutions.

Peer-led Support: CFSA Paths will increase instructional support for URM students in STEM through peer-led support in online and face-to-face environments. LSAMP peer coaches may help to facilitate peer-led study group activities or mentor LSAMP Scholars in the completion of their research projects. Through general LSAMP and STEM club activities, students may also lead group study sessions, tutoring in STEM subjects or peer-led workshops on guidance for studying and succeeding in STEM courses that support their peers in completion of their coursework.

LSAMP Focus: STEM Identity, Professional Experiences & Conferences

STEM Identity: CFSA Paths will offer on-campus and virtual workshops featuring STEM professionals that will be held for College faculty and URM students to learn about STEM careers, enhance STEM identity and expand STEM networks. Each CFSA institution will promote STEM student community and support LSAMP student interaction, workshops, presentations by STEM professionals and education and career opportunities. LSAMP team members will support students in gaining competence and confidence to compete for national research and internship opportunities.

STEM Conferences: CFSA Paths will host an annual alliance-wide conference – STEM Summit – for LSAMP students to engage with STEM professionals, learn about STEM transfer options, and support student researchers in presenting their work. CFSA will collaborate with other students, mentors, institutions and community partners throughout the community to facilitate the STEM Summit. CFSA Paths will invite LSAMP students to attend national STEM conferences (see budget justification). LSAMP Scholars will be encouraged and supported to submit applications to present their research at such conferences.

College & Industry tours: CFSA Paths will support college tours to university partners' institutions and offer in-person or virtual lab tours in STEM discipline areas at 4-year research institutions. Students will learn about careers through in-person or virtual STEM tours/field visit experiences with industry.

LSAMP Focus: STEM Professionalization Experiences through Paths to Engagement

LSAMP Research Scholars: CFSA will deepen the engagement of URM students in STEM undergraduate research experiences through an LSAMP Scholars Program that incentives participation. Grant funds are allocated to provide performance-based awards of $500 for a semester-long experience, reducing the risk of financially-related student dropout and potential workload conflicts due to student employment. LSAMP Scholars will conduct research either on campus or through an external placement with an industry or university partner. LSAMP Scholars will engage in a minimum of 40 hours in an undergraduate research, internship or lab experience, participate in cohort meetings, develop a research poster, and present their work at the LSAMP Showcase.

LSAMP Community Interns: The LSAMP Community Intern program is a STEM and social-justice oriented program. The program is intended to provide students with opportunity to explore how their envisioned STEM careers may contribute to their communities while examining social justice issues in the places where they live, learn, work, and serve. Students will improve their understanding and application of STEM knowledge and skills as they consider and implement strategies to make a difference in their communities. Students who participate in this program will be required to complete a minimum of 25 hours in an internship with a community partner, research a social justice issue connected to STEM, participate in cohort meetings, and present their internship experience in an artifact. Students who complete the one-semester long program will receive an award of $300.

LSAMP Peer Coaches: Students who participate in the LSAMP Scholars or Community Intern Program may apply to mentor/ coach other students in a variety of ways, including serving as peer mentors to students in LSAMP scholars, mentoring community interns, mentoring incoming freshman students, and/or supporting the summer bridge program and mentoring students in their UN SDG projects. As mentors or coaches, these students also lead/develop workshops and other opportunities for their peers. This is a one-semester long experience and students will receive an award of $500 upon successful completion of the program. Mentors/coaches will engage in a minimum of 40 hours of peer support, attend cohort meetings, and will create a capstone presentation showcasing their STEM Story and present these at the LSAMP Showcase.

Expected outcome/ how research findings will be used

The purpose of this evaluation is to conduct a comprehensive independent evaluation of the Study of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement (CFSA Paths) project. The evaluation will provide information to improve the project as it develops and progresses. Information is collected to help determine whether the project is proceeding as planned and whether it is meeting its stated program goals and project objectives according to the proposed timeline.

Other (informed consent, protocols)

Age of participants:

18 or older

Number of participants to be recruited – 200 students total across four campuses: 176 as Community Interns, Research Scholars, and/or Peer Coaches and 24 in other LSAMP experiences.

Special populations targeted: - Underrepresented minority (URM) students

Recruitment process: Students involved in the evaluation study will be LSAMP program members. Students are eligible to be LSAMP members if they are enrolled, degree seeking students with demonstrated intent to major in STEM. Preference is given to URM students.

Designation – I request that this research be considered expedited.

Supervisor sign off (PI)

First name

Last Name

Title/Role

Department/Office

Email

Request and Final signatures: Email and Sign

Central Florida IRB Application

Research question

The purpose of this study is to collect information about the impacts of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on participating college students and faculty affiliated with the College of Central Florida.

Description of the research you will conduct

The purpose of this study is to conduct an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). The evaluation will be conducted as a mixed methods study including both qualitative and quantitative measures. This study is guided by a series of research questions that assess the impacts on participating students, including early exposure to STEM pathways, careers and STEM-related concepts, experiences to foster students' science identities, application of STEM knowledge, participation in and completion of STEM research and internship experiences, and efficacy in ability to do college-level work (particularly but not exclusively in math courses) and intent to transfer after associates degree to a Transfer Pathways Partner school or other four year university program.

The study design includes (a) process evaluation to monitor implementation and provide feedback that goes beyond forming short-term solutions as well as (b) outcome/effectiveness evaluation to determine progress in the intended outcomes of the project. The process evaluation monitors activity-level (e.g., Summer Bridge, advising, student-led STEM skill-building) indicators, ultimately using these to determine correlations to short-term student outcomes (e.g., student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate). The outcome/effectiveness evaluation includes 10 strategic indicators across two goals. Several indicators will be used for a quasi-experimental design study utilizing a comparison group to assess the program's impact on student mid- and long-term outcomes.

<u>Process Evaluation</u>

Guiding evaluation questions for monitoring CFSA fidelity of implementation are:

d. To what extent were the key components of the CFSA Paths Activity Framework implemented with fidelity?
e. What was the amount of variation in implementation fidelity?
f. What was the relationship of fidelity of implementation to short-term outcomes associated with student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate?

<u>Outcome/Effectiveness Evaluation</u>

Design

An outcome study will be conducted in the final year of the project. This outcome study will utilize a quasi-experimental design (QED) to establish a cause-and-effect relationship between engagement with the LSAMP program and several indicators:

- SI.2 Increase in LSAMP URMs who maintain a GPA of 2.75 or higher;
- SI.3 Increased retention and persistence rates compared to prior grant years and non-LSAMP URM STEM students;
- SI.6 Increase in LSAMP URM student graduation rates;
- SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4 year baccalaureate programs.

The design is a non-equivalent groups design. In a nonequivalent groups design, it is expected that groups are not similar as they have not been randomly assigned but are being determined based on participation levels in LSAMP.

Groups will be determined based on engagement with the LSAMP program. Exploratory analysis will be conducted after Year 1 to refine to determine if grouping criteria for LSAMP activity participation is appropriate or if it needs to be modified. Three groups will be formed:

- Low Engagement: Students who complete the minimum requirements to remain an LSAMP member. Specifically:
    - Participation in 3 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) per semester; and
    - Meets with STEM advisor 1 time per semester.
- Medium Engagement: Students who demonstrate additional engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or more frequent participation in LSAMP experiences. Specifically:
    - Participation in 4-7 LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and
    - Meets with STEM advisor 1 or more times per semester.
- High Engagement: Students who demonstrate significant engagement in the LSAMP program, such as participating in an LSAMP program (i.e., Research Scholar, Community Intern, Peer Coach) or very frequent participation in LSAMP experiences. Specifically:
    - Participation in 8 or more LSAMP experiences (e.g., STEM tours, college tours, STEM conferences, and peer and student-led activities) or programs (i.e., Research Scholar, Community Intern, Peer Coach) per semester; and

- Meets with STEM advisor 1 or more times per semester.

Method of data collection.

This evaluation uses a mixed methods approach and will produce data that is both qualitative and quantitative in nature. Mixed methods increase the validity of studies, allow for triangulation strategies, and provide a more complete answer to evaluation questions. The evaluation framework, strategic indicators, fidelity of implementation matrices, and process monitoring matrices provide information about how data on indicators will be collected. As indicators in these documents span several program activities and data types, several tools have been developed to streamline data collection. Additionally, extent data will be collected from each of the four partner institutions on LSAMP students to include:

9. Unique identifiers for all students (with student proxy id generated by the higher ed institution)
10. Higher education institution in which student enrolled
11. Composite demographic information of all LSAMP members
12. Degree Seeking Status
13. Education Plan Designation
14. Cumulative GPA
15. Graduation records
16. Transfer application information

Virtual (Year 1) and in-person (Years 2-3) data collection includes focus group discussions with students and faculty/staff from all four CFSA partner institutions participating in the program. The researcher will conduct a site visit (virtual in year 1, in-person in year 2 and 3) to each of the four CFSA partner institutions at the time of an LSAMP event or program and will meet with focus group participants at Central Florida State College, Pasco-Hernando State College, Polk State College, and Valencia College. During focus group discussions, data will be collected via means of facilitated discussion using a written consent protocol and a semi-structured discussion protocol with discussion topics, questions, and probes. Participants will be invited by email approximately two weeks in advance of the focus group discussion; the email will include an attached consent form that includes study information and informed consent language. The consent form will be distributed in person at the focus group to ensure that all participants read and complete the form prior to participating in focus group discussions.

Survey data collection will be conducted using an online survey platform (Qualtrics). Students and partner institution staff will be briefed about the survey via email and provided the opportunity to ask questions about this data collection. Following this briefing, the participant will be sent an email invitation from the researcher along with a consent form that includes study information, utilizes informed consent language, and provides a unique link to the survey. The first page of the survey will reiterate the informed consent language and require response to a single question that provides consent to participate in the survey. If the participant selects “no” the participant will not be provided access to the survey.

Feedback forms will also be collected from participants at the completion of specific LSAMP activities. Forms are anonymous and responses will be reported in aggregate for each activity.

The following section details data collection tools and how they are used. Copies of all instruments and data collection tools are included in the evaluation plan.

- Detailed Implementation Report: The detailed implementation report will be filled out by Project Leads (i.e., the faculty/staff member responsible for the project) and verified by SEG (i.e., the external evaluator). This report aligned with the fidelity matrices (see attached Evaluation Plan), each indicator is accompanied by a question on the detailed implementation report. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. An extra column is provided for liaisons to include if they will be providing additional data sources. This form is filled out once per term (i.e., Fall, Spring, Summer).

- Strategic Indicators Report: The strategic indicators report will be filled out by Project Leads and verified by SEG. This report is aligned with the strategic indicators. Space is provided for Project Leads to provide the requested metric/information and the data source is specified. This form is filled out once per year (i.e., the end of the Summer term).

- Advising Log: The advising log will be filled out by advisors and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Advisors report on advising activities (e.g., meeting dates, topics) by student. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Engagement Opportunity Log: The Engagement Opportunity Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on engagement opportunities offered to LSAMP Students including date, leader, role of leader, modality, number of attendees, and if an attendee roster will be provided. This form is updated as activities occur and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Faculty Log: The faculty log will be filled out by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project Leads list all possible faculty participants and record faculty participation in activities (i.e., research mentor, working group, implementation team). Faculty name can be replaced with a unique identifier. This form is updated and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- STEM Professionalization Log: The STEM Professionalization Log will be filled out by project staff and verified by the Project Lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on STEM professionalization participation (i.e., research scholar, community intern, peer coach). This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

- Student Activity Log: The Student Activity Log will be filled out by project staff and verified by the Project lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on student participation in Summer Bridge, orientation, and This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

Following the approval of the evaluation plan, identification of a control group, and testing and refinement of data collection instruments, the external evaluator will proceed with data collection across all project years. In-person site visits are expected in years 2 and 3 of this grant.

Location(s) of the project.

College of Central Florida

Benefit to college. Additional justification is needed if the survey/interview is to be administered during class time.

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by LSAMP B2B funding from the National Science Foundation, seeks to strengthen the STEM educational ecosystem in Central Florida to support historically underrepresented minority (URM) students. This ecosystem is an interconnected, intentional network striving to support STEM education and literacy and to enhance college readiness and success in STEM through thoughtful engagement in proven and innovative strategies. This current project leverages the experience and success of the previously funded CFSA projects (HRD #1304966, HRD #1712683) and the comprehensive LSAMP model, while proposing innovative, evidence-based strategies to maximize opportunities in STEM for URM, community college students. This project builds on the Alliance's previous experience and evidence of success in supporting URM student recruitment, retention, and progression to four-year STEM degree programs. Valencia College (VC), a designated Hispanic-Serving Institution (HSI), will collaborate with community college partners, the College of Central Florida (CF), Pasco-Hernando State College (PHSC), and Polk State College (PSC). The project will deepen the STEM experience and engagement of LSAMP students, and ensure they are prepared to succeed in STEM baccalaureate programs. CFSA Paths also intends to achieve a 30% net increase in the number of URM students who successfully transfer into STEM baccalaureate degree programs over the three-year project period. This project will adapt best practices from the significant results of the CFSA and will specifically address barriers impacting success in STEM pathways for the large number of racially and ethnically minoritized students within Central Florida. Partners include: Florida Agricultural and Mechanical University (FAMU), a historically black institution (designated HBCU); Florida Institute of Technology (FIT), Florida Polytechnic University (Florida Poly); University of Central Florida (UCF), a HSI; University of Florida (UF); and University of South Florida (USF). The CFSA intends to grow and deepen partnerships with Florida State University System institutions to support data sharing and transfer pathways. The Alliance serves a diverse geographic area that expands over eight counties, including both small, rural communities and larger, metropolitan areas.

Surveys, feedback forms, focus groups, nor interviews will take place during class time.

How you will contact faculty of selected classes, if applicable.

No selected classes are involved. Faculty/staff who are involved with the LSAMP program will be contacted to participate.

Size of survey sample and how the participants will be selected.

200 students total across four campuses: 176 as Community Interns, Research Scholars, and/or Peer Coaches and 24 in other LSAMP experiences. Participants will be 18 years old or older. Students involved in the evaluation study will be LSAMP members. Students are eligible to be LSAMP Members if they are enrolled, degree seeking students with demonstrated intent to major in STEM. Preference is given to URM students. This IRB only asks for approval for students at Central Florida.

Whether or not data will be confidential and/or anonymous.

Data Anonymity/Confidentiality

At the beginning of surveys and all qualitative data collection, participants will receive written, and for focus groups, verbal assurance that their participation is voluntary, that they can opt out at any time, that their responses will not be reported individually, and that their responses will never be linked to their individual responses. Researchers will combine all participant responses and report them in aggregate form only.

Surveys will not collect any personally identifying information (PII) - such as name of respondents – that could permit disclosure or identification of respondents, directly or by inference. All surveys will be collected online using Survey Monkey or Qualtrics using the “anonymous response” feature to avoid storing identifiable information such as geo-location or IP addresses. The “anonymous response” setting is compatible with email communication. When both of these features are used together, the online platforms will track which contacts have not yet completed the survey and will send any reminders set up to these contacts, but the researchers will have no visibility to this process and will not be able to tie survey responses to specific email addresses. Data for subgroups with cell sizes lower than 5 will be redacted or suppressed.

For focus group discussions, names will not be asked, and the focus group facilitator will not be provided the names of participants in advance. Audio recordings will be destroyed immediately upon transcription, and the transcriptions will be reviewed to remove any PII prior to analysis.

Plans for limited-access data and data disposition.

Limited Access

Protecting the confidentiality of sensitive data is a priority of the research team. The researcher who is responsible for data collection, analysis, and reporting follows procedures and safeguards that limit access to data to other researchers on her team that are working on this project. Data that are collected by and/or data submitted to SEG (external evaluator) are stored in a cloud-based, password protected folder accessible only to assigned analysts. Computers are password protected.

Data Disposition

Upon completion of the project, the research team will ensure the secure destruction of all data originally provided or collected, employing digital or physical shredding of electronic or physical data.

What college resources/services will be needed to complete the request.

LSAMP Project Staff at Central Florida will be responsible for collecting data. In addition to LSAMP Project Staff the Institutional Research office will provide student-level data on degree seeking status, education plan designation, cumulative GPA, graduation records, and transfer application information.

Expected outcome and how research findings will be used.

The purpose of this evaluation is to conduct a comprehensive evaluation of the Study of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement (CFSA Paths) project. The evaluation will provide information to improve the project as it develops and progresses. Information is collected to help determine whether the project is proceeding as planned and whether it is meeting its stated program goals and project objectives according to the proposed timeline.

Consent Forms

Dear Student,

Shaffer Evaluation Group is conducting a study to complete an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). All LSAMP member who are over the age of 18 are eligible to participate.

A sample of students will be asked to participate in a focus group, not to exceed one hour. During the focus group students will be asked about their experiences during the LSAMP program.

You may skip questions or discontinue participation at any time. Your decision to participate or not participate will not affect your participation in this program or your relationships with your project administrators.

All information will be handled in a strictly confidential manner, subject to the disclosure requirements of Florida Sunshine Laws, so that no one will be able to identify you when the results are recorded/reported. All information is subject to the Family Educational Rights and Privacy Act (FERPA) of 1974, which is designed to protect the privacy of educational records.

Your participation in this study is totally voluntary and you may withdraw at any time without negative consequences. To withdraw at any time during the study, simply contact Patricia Moore Shaffer, External Evaluator at patricia@shafferevaluation.com, 703.582.9749 or 1769 Jamestown Road, Suite 117, Williamsburg, VA 23185.

Please feel free to contact Patricia Moore Shaffer at 703.582.9749 if you have any questions about the study. Or, for other questions, contact the Chair of Valencia's Institutional Review Board at irb@valenciacollege.edu.

Documentation of Consent:

o I have read this form and decided that I will participate in the focus group described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time.

o I have read this form and decided that I will not participate in the focus group described above.

Dear Faculty/Staff Member,

Shaffer Evaluation Group is conducting a study to complete an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). All LSAMP member who are over the age of 18 are eligible to participate.

A sample of faculty/staff member will be asked to participate in a focus group, not to exceed one hour. During the focus group faculty and staff will be asked about their experiences with the LSAMP program.

You may skip questions or discontinue participation at any time. Your decision to participate or not participate will not affect your participation in this program or your relationships with your project administrators.

All information will be handled in a strictly confidential manner, subject to the disclosure requirements of Florida Sunshine Laws, so that no one will be able to identify you when the results are recorded/reported. All information is subject to the Family Educational Rights and Privacy Act (FERPA) of 1974, which is designed to protect the privacy of educational records.

Your participation in this study is totally voluntary and you may withdraw at any time without negative consequences. To withdraw at any time during the study, simply contact Patricia Moore Shaffer, External Evaluator at patricia@shafferevaluation.com, 703.582.9749 or 1769 Jamestown Road, Suite 117, Williamsburg, VA 23185.

Please feel free to contact Patricia Moore Shaffer at 703.582.9749 if you have any questions about the study. Or, for other questions, contact the Chair of Valencia's Institutional Review Board at irb@valenciacollege.edu.

Documentation of Consent:

o I have read this form and decided that I will participate in the focus group described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time.

o I have read this form and decided that I will not participate in the focus group described above.

APPENDIX E: DATA MANAGEMENT PLAN

Principal Investigator: Dr. Kathleen Plinske, Valencia College
Co-Principal Investigator: Ms. Eda Davis-Lowe, Valencia College
Co-Principal Investigator: Mr. Reginal Webb, Polk State College
Co-Principle Investigator: Dr. Gerene M. Thompson, Pasco Hernando State College
Co-Principle Investigator: Dr. Allan Danuff, College of Central Florida

Privacy of Personal Data and Reuse of Anonymized Data by Others: The Central Florida STEM Alliance (CFSA) colleges' have policies in place for privacy protections that will be extended to those accessing the project data. All student, faculty, and staff data will be stripped of identifiers and only the PI and Co-PIs will have the identifier key. Colleges have ensured security procedures are followed with increased level of protection through password protected intranet and hardware storage. Personal data confidentiality is upheld and any data reported or presented will preserve the anonymity of students, faculty, and staff by not revealing identifying characteristics and with the exception of interviews or other data collection procedures within which the participant consents to and authorizes use of their name, voice, photograph, or written words. Colleges offer protection for those involved in the work from any claim that their "intellectual property" harmed a population or misrepresented information, while simultaneously allowing the shared use of the property on a broad scale.

Types of Data, Metadata, and Resources: CFSA Colleges' student information systems will be used to determine baseline data and track and collect data elements for reporting and program improvement analysis. Underrepresented minority students (URM) will be identified. For this project, these students will include African American, Hispanic, Native American, Alaskan Native, Native Hawaiian, and Native Pacific Islander students. Student data elements that will be collected include: student demographics (gender, race/ethnicity), performance, and academic program enrollment and transfer information. Consistent collection of data will allow for the dissemination of accurate and consistent information across the CFSA. When possible and to the extent allowable by law, data will be collected from the K-12 system to track students into the respective colleges. Student records are maintained through database management and kept in secure online platform. Data captured is both quantitative (numbers declaring a STEM major, fall-to-fall and fall to spring retention and persistence rates; GPA; and others) and Qualitative (student interaction with STEM faculty and project support staff; observations of student success through project, exit surveys, post-graduation/alumni surveys). The project team is especially interested in the collection of data on underrepresented minority students to measure sense of belonging, self-efficacy, and development of a STEM identity, as well as the correlation between STEM and social justice (STEMJ) and motivation to persist in STEM pathways. The PI and Co-PI, in collaboration with the college's data collection systems and the external evaluator, will use quantitative and qualitative analytics and application data collected to measure success of the project's outcomes including recruitment and student success strategies.

University partners will provide customized reports on the tracking of URM STEM graduates from the CFSA colleges so that progress will be measured in enrollment at the university, progression in STEM majors and for those who graduate. The Offices of Institutional Research at the expanded university partners will also support data sharing in agreements outlining these activities finalized during the project period. The data gathered can be disaggregated by major, ethnicity, and gender so that additional success strategies can be identified and implemented as needed to improve success of specific student subgroups.

Data Format: Standards for data management and access are administered by the CFSA Offices of Information Technology supporting high quality, progressive academic learning environments including learning technology and alternative delivery. Working collaboratively with these offices are staff members involved in institutional research which provides a secure venue for actively managing college-wide data. The mission of the this function is to contribute data, information, and analysis to the CFSA colleges' culture of inquiry and evidence in support of learning assessment, decision-making, strategic planning,

continuous improvement, and mandatory reporting.

The CFSA colleges utilize software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using shared transfer protocols including wide and local area networks, the Colleges use an enterprise-based intranet where folders and files are shared. Research staff access the data from the Colleges' student information system to create reports and assist the college staff with complex, ongoing research projects and data analysis using various file formats. Ultimately, these outputs are designed to provide an electronic resource for both internal and external stakeholders. Numerous documents are available that includes aggregated data analyses of success measures relevant to the college communities. Metadata is also embedded in HTML documents on the Colleges' websites.

Policies for Access, Sharing, and Provisions for Appropriate Protection/Privacy: The CFSA Colleges have numerous policies adopted by their respective Boards of Trustees. Policies include those related to the acceptable use of information technology resources which identifies user's rights and responsibilities including liability, privacy and security, and consequences for violations as well as the Colleges' rights and responsibilities including user IDs and passwords, use of information/data, and use of software and hardware. At the CFSA Colleges, other relevant policies may include Academic Freedom, Research by Faculty, Copyright, Information Technology Resources, Computer Hardware and Software, Online Privacy, Access and Security, Student Records, Financial Information Security, Human Resource Record Information, Preservation and Disposal of Records, Notification of Social Security Number Collection and Usage, and Web Standards. Faculty and staff training on held periodically on policies.

CFSA Colleges also follow Family Educational Rights and Privacy Act (FERPA) guidelines, as well as participating in the Institutional Review Board (IRB) process. Under this grant program, deliverables will be made available as Open Educational Resources (OER) such as teaching and learning materials that others may freely use and reuse, without charge.

Policies for Archiving Data, Samples, and Other Research Products for Preservation: The CFSA Colleges have policies on the Preservation and Disposal of Records that includes reference to photographs or microphotographs. Although there is no official policy for maintaining data management and access of supporting documentation for work conducted by faculty or staff, any work performed by the project investigators or other personnel under the NSF grant project will be maintained in a data repository in a secure environment that will be organized appropriately to facilitate adequate search protocols for the legacy data, supported by both digital identification and archived for preservation. In the event project faculty or staff exits the CFSA Colleges, the data, samples, and other research products will be secured and preserved. The lineage of a digital object will be documented. The CFSA will explore archiving and preservation frameworks to determine the most compatible system for the project. This archive and project records will be retained for a reasonable length of time and will follow NSF guidelines. If applicable, open source standards will be made available, describing in detail the capture of data and the collection of meaningful assessment. The project team will make the numbers used for graphs or tables available for others to recreate in comparison of their own data. Primary data will be shared with other researchers. A blind copy of primary student measures will be made available to researchers who are encouraged to include in meta research or who are conducting sets, for example, when a demographic variable is assigned to five or fewer students in the sample they would be removed.

APPENDIX F: DATA COLLECTION GUIDE

Appendix B: Fidelity of Implementation Assessment

Student Focused Fidelity

The following section includes the student focused fidelity tables. Please note the following data is calculated from staff-submitted logs. In some cases, numbers of students varied across logs from the same institution. Further, in some cases submitted data included records of students served by the advisors/in the STEM club who were not official LSAMP members. Table 1 shows the differences in reported numbers by source. The total number of students from each data source is listed with the source in the status columns throughout the following tables.

Table 1. Number of Total Students per Data Source by Institution, by Term

	Term	Advising Log	Student Activity Log	Orientation Data	Total Number of LSAMP Members
College of Central Florida	Spring 2022	8	8	8	7
	Summer 2022	12	12	5	12
	Fall 2022	7	6	6	
Pasco-Hernando State College	Spring 2022	N/A	N/A	N/A	No Students in Spring 2022
	Summer 2022	3	3	3	3
	Fall 2022	9	9	9	9
Polk State College	Spring 2022	65	72	72	52
	Summer 2022	48	48	48	48
	Fall 2022	Not Available at Time of Report	93	93	93
Valencia College	Spring 2022	28	74	74	40
	Summer 2022	18	46	46	84
	Fall 2022	40	22	22	75

Note: Cells highlighted in green indicate the number of students reported on in the data source match the number of LSAMP members.

Table 2. Student Focused Fidelity of Implementation Matrix 1: Summer Bridge

Notes on SF 1.1-1.9 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 1.1: High school seniors and first time in college students participate in the Summer STEM Institute.	Number of student participants in Summer STEM Institute	Detailed Implementation Report; Rosters of Summer STEM Institute program	**Summer 2022**	1 Student Participant	3 Student Participants	13 Student Participants	14 Student Participants	31 Student Participants
SF 1.2: Summer STEM Institute includes workshops and presentations by STEM professionals and college/university faculty.	Number of workshops and presentations by STEM professionals and college/university faculty	Detailed Implementation Report; Schedule from Summer STEM Institute	**Summer 2022**	6 workshops and presentations by STEM professionals and college/ university faculty.	6 workshops and presentations by STEM professionals and college/ university faculty.	6 workshops and presentations by STEM professionals and college/ university faculty.	6 workshops and presentations by STEM professionals and college/ university faculty.	12 workshops and presentations by STEM professionals and college/ university faculty.
SF 1.3: Summer STEM Institute will be offered in hybrid/virtual modalities.	Evidence of hybrid/virtual modality offered	Detailed Implementation Report; Schedule from hybrid/virtual Summer STEM Institute	**Summer 2022**	Hybrid format offered.	In-person format offered.	In-person format offered.	Hybrid format offered.	50% of institutions (*n*=2) offered a hybrid format.
SF 1.4: Summer STEM Institute activities include hands-on STEM Activities.	Evidence of hands-on activities at Summer STEM Institute	Detailed Implementation Report; Schedule from Summer STEM Institute; other documentation (e.g., photos)	**Summer 2022**	The SSI offered at each institution included hands-on STEM activities.				

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 1.5: Summer STEM Institute includes STEM Career Pathway activities.	Evidence of STEM Career Pathway activities at Summer STEM Institute	Detailed Implementation Report; Schedule from Summer STEM Institute	**Summer 2022**	The SSI offered at each institution included STEM Career Pathway activities.				
SF 1.6: Summer STEM Institute includes information on institutional resources and tools to support college readiness and success.	Evidence of sharing information on institutional resources and tools to support college readiness and success at Summer STEM Institute	Detailed Implementation Report; Schedule from Summer STEM Institute; other documentation (e.g., photos, copies of resources)	**Summer 2022**	The SSI offered at each institution included information on institutional resources and tools to support college readiness and success.				
SF 1.7: Summer STEM Institute includes activities to learn about the UN Sustainable Development Goals (UN SDGs).	Evidence of activities on the UN-SDGs at the Summer STEM Institute	Detailed Implementation Report; Schedule from Summer STEM Institute	**Summer 2022**	The SSI offered at each institution included activities to learn about UN SDGs.				
SF 1.8: Students develop projects that support attainment of the UN SDGs in their local communities.	% of students who developed projects to support attainment of UN SDGs in their local communities	Detailed Implementation Report; Schedule from Summer STEM Institute; Roster of students with project status	**Summer 2022**	100% of students (*n*=1) completed UN-SDG projects.	100% of students (*n*=3) completed UN-SDG projects.	Data not available at the time of report.	71% of students (*n*=10) completed UN-SDG projects.	78% of students (*n*=14) completed UN-SDG projects.
SF 1.9: Students are satisfied with the Summer Bridge experience.	% of students satisfied with Summer Bridge	Detailed Implementation Report; Student feedback survey	**Summer 2022**	Data not available (no students completed the survey)	100% of students (*n*=1) satisfied with Summer Bridge.	100%% of students (*n*=3) satisfied with Summer Bridge.	100% of students (*n*=8) satisfied with Summer Bridge.	100% of students (*n*=12) satisfied with Summer Bridge.

SF 1.1: The alliance held Summer STEM Institute (SSI) in July 2022. The College of Central Florida, Pasco-Hernando State College, and Valencia College all collaborated to offer a hybrid Summer STEM Institute at Valencia. Polk State College offered an in-person Summer STEM Institute with their students. In total, 31 students across the alliance participated in Summer STEM Institute.

SF 1.2: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included 6 workshops and presentations by STEM professionals and college/ university faculty. These included a faculty panel, a panel on careers in STEM, and hands-on activities (see SF 1.4 for more detail).

The SSI offered to students at Polk State College included 6 workshops and presentations by STEM professionals and college/ university faculty. These included lab tours of the Engineering 3D Laboratory and a Physics Laboratory tour/demonstration.

SF 1.3: The College of Central Florida, Pasco-Hernando State College, and Valencia College collaborated on the SSI, and their students interacted using a hybrid format (i.e., virtually with exception of the final in-person field trip day). However, Pasco-Hernando State College students were in-person at their home institution while they did this. Polk State College students were also in person for the whole SSI.

SF 1.4: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included hands-on STEM activities. These included making water bottle rockets, making Oobleck, and an exploration of the SARS-CoV-2 (COVID-19) pathophysiology using bioinformatic tools.

The SSI offered to students at Polk State College included hands-on STEM activities. These included activities designed to get students to work on problem solving and data collection.

SF 1.5: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included STEM career pathway activities. These included a STEM career panel, a STEM career self-guided activity on career exploration, and various activities to support students in exploring specific careers (e.g., bioinformatic activities, chemistry hands-on activities).

The SSI offered to students at Polk State College included STEM career pathway activities. These included sessions such as an Emerging STEM Careers Session and exploratory activities such as a Geo Science tour and laboratory demonstration.

SF 1.6: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included sharing information on institutional resources and tools to support college readiness and success. Each institution held a

Resources Roundtable to share helpful resources available to students, as well as opportunities to apply for internships and scholarships. Financial Aid, Counseling, and the Career Center.

The SSI offered to students at Polk State College included sharing information on institutional resources and tools to support college readiness and success. This included an introduction to career services.

SF 1.7: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included UN-SDG activities. On the first day of the institute, students learned about the UN-SDGs and started planning projects within groups. This was the same for students at Polk State College. All SSI opportunities included time for students to work with their groups throughout the week.

SF 1.8: The joint SSI offered to students at the College of Central Florida, Pasco-Hernando State College, and Valencia College included students working in groups to complete UN-SDG projects. Of the 18 students in attendance, 77% (*n*=14) completed projects. Project are available on the CFSA website (https://cfstemalliance.wordpress.com/2022/07/29/summer-stem-institute-2022-comes-to-completion/). Students presented their projects on the final day of SSI.

The SSI offered to students at Polk State College included students working in groups to complete UN-SDG projects. Of the 13 students who participated throughout the workshop, 53% (*n*=7) presented their projects on the final day of SSI.

SF 1.9: 100% of SSI Feedback Form respondents (*n*=12) reported they would recommend the SSI to a peer.

Table 3. Student Focused Fidelity of Implementation Matrix 2: Appropriate Math Course Placement

Notes on SF 2.1-2.3 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 2.1: Graduating high school seniors complete a mathematics assessment to determine their math skill level.	% of graduating high school seniors with mathematics assessment data	Detailed Implementation Report; De-identified student-level records of with assessment scores; overall enrollment numbers	**Summer 2022**	N/A	N/A	N/A	N/A	
SF 2.2: Students meet with dedicated STEM advisor to discuss appropriate math course placement.	% of students meeting with STEM advisor to discuss math course placement.	Detailed Implementation Report; Advising Log	**Summer 2022**	Students at all SSI meet with advisors to discuss appropriate math course placement.				
SF 2.3: Students can earn math course waivers after successful completion of math advising and the necessary standardized tests/assessments.	Evidence of math course waiver opportunity	Detailed Implementation Report; Documentation (e.g., student information packet, roster of students who earned course waivers) of course waiver opportunity	**Summer 2022**	Math course waivers are offered to students.	Math course waivers are unable to be offered due to the cost.	Math course waivers are unable to be offered due to the cost.	Math course waivers are offered to students.	50% of institutions (*n*=2) are able to fund math course waivers.
	# of students who utilized math course waivers	Detailed Implementation Report; Advising Log	**Summer 2022**	0 students utilized math course waivers.	N/A	N/A	5 students utilized math course waivers.	5 students utilized math course waivers.

SF 2.1-2.2: All institutions review students' mathematics portion of Florida's Postsecondary Education Readiness Test (P.E.R.T). Further, all students who attend the Summer STEM Institute meet with advisors either during the institute or at another time to guide their mathematics course placement (this is based on the institution's enrollment advising).

SF 2.3: 50% of institutions are able to offer math course waivers to students who attend and complete SSI (College of Central Florida, Valencia College). The other institutions have reported they cannot fund this component. Students must enroll in the math course the following fall to receive the waiver.

At the College of Central Florida, the one student who participated in SSI did not utilize the math course waiver. At Valencia College, seven students qualified, but five utilized the waiver. Of the two who did not, one student was already having all of their tuition paid for and the other registered for a course that ultimately did not run.

Table 4. Student Focused Fidelity of Implementation Matrix 3: Student Recruitment and Engagement

Notes on SF 3.1-3.4 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 3.1: Students participate in orientation (through summer STEM institute bridge program or dedicated orientation offered during the summer, fall, or spring).	% of LSAMP students who participate in orientation.	Detailed Implementation Report; Student Activity Log	**Spring 2022**	75% of students (*n*=6) completed orientation.	N/A	90% of students (*n*=65) completed orientation.	100% of students (*n*=74) completed orientation.	94% of students (*n*=145) completed orientation.
			Summer 2022	80% of students (*n*=4) completed orientation.	100% of students (*n*=3) completed orientation.	83% of students (*n*=93) completed orientation.	67% of students (*n*=31) completed orientation.	76% of students (*n*=78) completed orientation.
			Fall 2022	100% of students (*n*=6) completed orientation.	89% of students (*n*=8) completed orientation.	100% of students (*n*=93) completed orientation.	100% of students (*n*=22) completed orientation.	99% of students (*n*=129) completed orientation.
SF 3.2: At least 90% of all LSAMP students belong to racially and ethnically minoritized group (URM).	% of LSAMP students who belong to racially and ethnically minoritized groups	Detailed Implementation Report; Strategic Indicators Report	**Spring 2022**	14% of students (*n*=1) were URM students.	N/A	83% of students (*n=43*) were URM students.	73% of students (*n=29*) were URM students.	74% of students (*n=73*) were URM students.
			Summer 2022	Data not available at the time of report.	33% of students (*n*=1) were URM students.	75% of students (*n*=36) were URM students.	61% of students (*n*=51) were URM students.	65% of students (*n*=88) were URM students.
			Fall 2022	Data not available at the time of report.	67% of students (*n*=6) were URM students.	75% of students (*n*=70) were URM students.	71% of students (*n*=53) were URM students.	73% of students (*n*=129) were URM students.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 3.3: Students meet with advisors at least 1 time per semester.	% of students who meet with their advisor at least 1 time per semester	Detailed Implementation Report; Advising Log	**Spring 2022**	100% of students (*n*=8) met or exceeded the requirement.	N/A	69% of students (*n*=45) met or exceeded the requirement.	79% of students (*n*=22) met or exceeded the requirement.	74% of students (*n*=75) met or exceeded the requirement.
			Summer 2022	100% of students (*n*=12) met or exceeded the requirement.	67% of students (*n*=2) met or exceeded requirement.	73% of students (*n*=35) met or exceeded requirement.	100% of students (*n*=18) met or exceeded requirement.	83% of students (*n*=65) met or exceeded requirement.
			Fall 2022	100% of students (*n*=7) met or exceeded requirement.	78% of students (*n*=7) met or exceeded requirement.	Data not available at the time of report.	98% of students (*n*=39) students met or exceeded requirement.	95% of students (*n*=53) met or exceeded requirement.
SF 3.4: Students participate in at least 3 LSAMP experiences per semester.	% of students participating in at least 3 LSAMP experiences per semester	Detailed Implementation Report; Student Activity Log	**Spring 2022**	38% of students (*n*=3) met or exceeded the requirement.	N/A	41% of students (*n*=30) met or exceeded the requirement.	22% of student (*n*=16) met or exceeded the requirement.	32% of students (*n*=49) met or exceeded the requirement.
			Summer 2022	0% of students (*n*=0) met or exceeded requirement.	0% of students (*n*=0) met or exceeded requirement.	31% of students (*n*=15) met or exceeded requirement.	20% of students (*n*=9) met or exceeded requirement.	22% of students (*n*=24) met or exceeded requirement.
			Fall 2022	0% of students (*n*=0) met or exceeded requirement.	0% of students (*n*=0) met or exceeded requirement.	30% of students (*n*=28) met or exceeded requirement.	68% of students (*n*=15) met or exceeded requirement.	33% of students (*n*=43) met or exceeded requirement.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 3.1: The percent of students attending orientation at each institution varied by term. In Summer 2022, the lowest overall percentage of students were reported as completing orientation (76%), but it is unclear why there was such a significant drop

compared to Spring 2022 (94%). Further, the percentage of students completing orientation in Fall 2022 was very high (99%). All institutions offered more than one orientation date. Valencia offered three different orientation types to meet the needs of a variety of students including an in-person session, two virtual sessions, and one asynchronous, on-demand session. The College of Central Florida, Polk State College, and Pasco-Hernando College also provided individual orientation to students as needed.

SF 3.2 The percent of LSAMP members who belonged to racially and ethnically minoritized groups varied by institution. By the end of Year 2, 73% of students (*n*=129) belonged to a racially and ethnically minoritized group.

SF 3.3: The majority of students at all institutions met with their advisors at least once per term in Spring 2022 (74%) and Fall 2022 (95%). While Summer 2022 is presented (83%), students are not required to meet with their advisors during the summer. The percentage of students meeting with their advisors increased throughout Year 2.

SF 3.4: The percent of students participating in at least 3 LSAMP experiences varied by term and across institutions. In Spring 2022, 32% of students (*n*=49) met the requirement across the alliance. In Fall 2022, 33% of students (*n*=43) met the requirement across the alliance. While Summer 2022 is presented (22%), students are not required to meet this requirement during the summer. While the percentages of students meeting the requirement are low, this is similar to the participation percentage reported in Year 1 (35%).

Table 5. Student Focused Fidelity of Implementation Matrix 4: Dedicated STEM Academic Advising

Notes on SF 4.1 are presented after the table.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 4.1: Students are satisfied with dedicated STEM academic advising.	% of students satisfied with STEM academic advising	Detailed Implementation Report; Student Survey	**Year 2**	Not Available	Not Available	Not Available	Not Available	100% of students (*n*=7) were satisfied with STEM academic advising.

SF 4.1: On the pulse survey, students were asked if they had participated in STEM academic advising and if they were satisfied with the advising they received. Of the 14 students who responded to the survey, 8 reported participating in advising. Of the 8 students who participated in advising, 7 students responded about their satisfaction. 100% of respondents (*n*=7) were satisfied with academic advising, with 86% of respondents (*n*=6) strongly agreeing they were satisfied with advising.

Table 6. Student Focused Fidelity of Implementation Matrix 5: Student-led STEM Skill Building and Peer Support

Notes on SF 5.1-5.4 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 5.1: LSAMP students, including Peer Coaches and STEM club members, lead presentations and engagement opportunities for other LSAMP students and the broader STEM community.	# of presentations and engagement opportunities led by LSAMP students	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	14 different events were led by students.	N/A	36 different events were led by students.	14 different events were led by students.	64 different events were led by students.
			Summer 2022	4 different events were led by students.	0 events were led by students.	0 events were led by students.	13 different events were led by students.	17 different events were led by students.
			Fall 2022	1 event was led by students.	1 event was led by student.	10 different events were led by students.	30 different events were led by students.	42 different events were led by students.
SF 5.2: Peer Coaches and STEM club members facilitate informal support sessions for peers to connect and discuss achievements and challenges.	# of informal support sessions led by Peer Coaches and STEM club members	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	At least 1 informal support session was led by students.	N/A	At least 1 informal support session was led by students.	At least 1 informal support session was led by students.	At least 3 informal support session was led by students.
			Summer 2022	Informal support sessions were not held by students.	Informal support sessions were not held by students.	Informal support sessions were not held by students.	At least 1 informal support session was led by students.	Data only available for one institution.
			Fall 2022	Informal support sessions were not held by students.	Informal support sessions were not held by students.	Data not available at the time of report.	At least 5 informal support session was led by students.	Data only available for one institution.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 5.3: STEM skill-building workshops and peer supports utilize technology to engage students across institutions.	Evidence of STEM-skill building workshops and peer support activities with hybrid/virtual formats	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	4 events were held in a virtual/hybrid setting.	N/A	20 events were held in a virtual/hybrid setting.	48 events were held in a virtual/hybrid setting.	72 events were held in a virtual/hybrid setting.
			Summer 2022	1 event was held in a virtual/hybrid setting.	1 was held in a virtual/hybrid setting.	2 events were held in a virtual/hybrid setting.	19 events were held in a virtual/hybrid setting.	23 events were held in a virtual/hybrid setting.
			Fall 2022	No events were held in a virtual or hybrid setting.	5 events were held in a virtual/hybrid setting.	0 events were held in a virtual/hybrid setting..	17 events were held in a virtual/hybrid setting.	22 events were held in a virtual/hybrid setting.
SF 5.4: Students are satisfied with student-led STEM skill building workshops and peer supports.	% of students satisfied with student-led STEM skill building workshops and peer supports	Detailed Implementation Report; Event Feedback Forms	**Spring 2022**	100% of students (*n*=3) satisfied with student-led workshops and peer supports.	N/A	100% of students (*n*=8) satisfied with student-led workshops and peer supports.	94% of students (*n*=17) satisfied with student-led workshops and peer supports.	97% of students (*n*=28) satisfied with student-led workshops and peer supports.
			Summer 2022	Only 1 response to Student Event Feedback Form.	No responses to Student Event Feedback Form.	No responses to Student Event Feedback Form.	100% of students (*n*=2) satisfied with student-led workshops and peer supports.	Data only available for one institution.
			Fall 2022	100% of students (*n*=2) satisfied with student-led workshops and peer supports.	Only 1 response to Student Event Feedback Form.	67% of students (*n*=2) satisfied with student-led workshops and peer supports.	100% of students (*n*=12) satisfied with student-led workshops and peer supports.	94% of students (*n*=16) satisfied with student-led workshops and peer supports.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 5.1: All institutions held student led events in Year 2. Valencia College held the most student-led events (*n*=57) in Year 2. Pasco-Hernando State College, the newest alliance institution, held one student-led event in Fall 2022, which was their first term holding events (with exception of Summer STEM Institute, which is faculty and staff led across the alliance).

SF 5.2: At the majority of institutions, there was no evidence of informal support sessions being led by students. These opportunities are intended to be led by STEM Club Members and Peer Coaches. However, peer coaching has been implemented on a limited basis at one institution to date. Across the alliance, 12 informal support sessions were held. However, it is believed that these types of activities may be being held but not tracked by advisors. For example, students at Polk State College tutor each other frequently based on conversations with project staff and students, however, this is not presented in the LSAMP Engagement Opportunity Log. The evaluator will work with project staff to try to capture these opportunities. It is also expected that the number of opportunities will increase once Peer Coaches are selected more frequently.

SF 5.3: Institutions held a variety of virtual events to engage students, including the annual STEM Summit. In total, 117 events were offered in a hybrid/virtual format across the alliance.

SF 5.4: According to responses on the General Student Event Feedback Form, students were satisfied overall with student-led STEM skill building workshops and peer support. In Year 2, 96% of students (*n*=44) were satisfied.

Table 7. Student Focused Fidelity of Implementation Matrix 6: Peer-led Supports

Notes on SF 6.1-6.3 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 6.1: Peer coaches facilitate study groups, activities, or mentor students in completion of research projects.	# of study groups led by Peer Coaches, # of students mentored by Peer Coaches	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	N/A	N/A	N/A	N/A	No students were eligible to be Peer Coaches in Spring of 2022.
			Summer 2022	No students were Peer Coaches.	N/A	No students were Peer Coaches.	No students were Peer Coaches.	No students were Peer Coaches.
			Fall 2022	No students were Peer Coaches.	No students were eligible to be Peer Coaches	No specific data on peer coaching was provided.	No students were Peer Coaches.	Data only available at one institution.
SF 6.2: Students lead activities (e.g., group study sessions, tutoring in STEM subjects, peer-led workshops)	# of activities led by students (e.g., group study sessions, tutoring in STEM subjects, peer-led workshops)	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	7 events led by students (partially or fully).	N/A	18 events led by students (partially or fully).	7 events led by students (partially or fully).	32 events led by students (partially or fully).
			Summer 2022	4 events led by students (partially or fully).	0 events led by students (partially or fully).	0 events led by students (partially or fully).	13 events led by students (partially or fully).	17 events led by students (partially or fully).
			Fall 2022	1 event led by students (partially or fully).	1 event led by students (partially or fully).	10 events led by students (partially or fully).	37 events led by students (partially or fully).	39 events led by students (partially or fully).
SF 6.3: Students are satisfied with peer-led supports.	% of students satisfied with peer-led supports	Detailed Implementation Report; Event Feedback Forms	**Year 2**	Due to the low response rate on the General Student Event Feedback Form for these types of events, data were calculated across the alliance and for the entire year. In Year 2, 100% of students (*n*=3) were satisfied with peer-led supports.				

Note: Pasco-Hernando State College did not have LSAMP members until Summer 2022 and will not be able to have Peer Coaches until Spring 2022.

SF 6.1 LSAMP members are not eligible to become Peer Coaches until they have been a member for a full semester and they have participated as a Research Scholar or Community Intern. The first term institutions could have Peer Coaches would have been Fall 2022. No institutions had Peer Coaches in Year 2.

SF 6.2: The percentage of events being led by students varied by institution and term. In Spring 2022, the percentage ranged from 11% of events at Valencia College to 100% of events at the College of Central Florida. In total, 36% of events across the alliance in Spring 2022 were led or partially led by students.

In Summer 2022, the percentage across the alliance dropped to 29% of events, with a range of 0% (i.e., Polk State College, Pasco-Hernando State College) to 100% (College of Central Florida) of events being led or partially led by students.

In Fall 2022, the percentage across the alliance increased significantly to 71% of activities being led or partially led by students. While the range still varied significantly (14% at Pasco-Hernando State College to 100% at the College of Central Florida), there was progress.

SF 6.3: Due to the low response rate on the General Student Event Feedback Form for these types of events, data were calculated across the alliance and for the entire year and not disaggregated by institution or event. In Year 2, 100% of students (*n*=3) were satisfied with peer-led supports.

Table 8. Student Focused Fidelity of Implementation Matrix 7: STEM Identity

Notes on SF 7.1-7.3 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 7.1: On-campus and virtual workshops are offered to learn about STEM careers, enhance STEM identity, and expand STEM networks.	# of workshops offered to students on STEM careers, STEM identity, and STEM networking.	Detailed Implementation Report; Engagement Opportunity Log	**Spring 2022**	1 workshop was offered to students.	N/A	2 workshops were offered to students.	6 workshops were offered to students.	9 workshops were offered to students.
			Summer 2022	No workshops were offered to students.	No workshops were offered to students.	3 workshops were offered to students.	7 workshops were offered to students.	10 workshops were offered to students.
			Fall 2022	No workshops were offered to students.	2 workshops were offered to students.	4 workshops were offered to students.	2 workshops were offered to students.	8 workshops were offered to students.
SF 7.2: Institutions promote STEM student community and support student interaction, workshops, and presentations by STEM professionals.	Evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	Detailed Implementation Report; Documentation of promotion (e.g., Newsletter)	**Year 2**	There is evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	There is evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	There is evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	There is evidence of promotion of STEM student community and support student interaction, workshops, and presentations by STEM professionals.	At 100% of institutions (*n*=4) there is evidence of this activity.
SF 7.3: Team members support students in competing for national research and internship opportunities.	# of students who are supported in competing for national research and internship opportunities.	Detailed Implementation Report; Advising Log; Student Survey	**Year 2**	Data not available at the time of this report.	1 student supported in competing for national research and internship opportunities.	12 students supported in competing for national research and internship opportunities.	Data not available at the time of this report.	13 students supported in competing for national research and internship opportunities.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 7.1: Workshops on STEM careers and expanding STEM networks were offered at institutions. In Year 2, a total of 27 opportunities were offered across the CFSA. Each alliance institution held at least one event.

SF 7.2: During project staff interviews with each institution, staff explained the importance of the learning management system. Each institution has a shell in the learning management system where all LSAMP members are added. This is one of the main ways opportunities are shared with students. Each institution also has STEM clubs which provide STEM communities to students.

SF 7.3: Data on the number of students supported was provided by Polk State College and Pasco-Hernando State College. Across the alliance, at least 13 students were supported.

Table 9. Student Focused Fidelity of Implementation Matrix 8: STEM Conference

Notes on SF 8.1-8.3 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 8.1: STEM Summit, an alliance-wide conference, is held annually.	# of students who attend the annual STEM Summit.	Detailed Implementation Report; Roster of STEM Summit attendees	**Spring 2022**	6 students attended the STEM Summit.	16 students attended the STEM Summit.	18 students attended the STEM Summit.	13 students attended the STEM Summit.	53 students attended the STEM Summit.
	Evidence STEM Summit was held.	Detailed Implementation Report; Roster of STEM Summit attendees	**Spring 2022**	N/A	N/A	N/A	N/A	All institutions participated in the Spring 2022 STEM Summit.
SF 8.2: LSAMP students attend national STEM conferences.	# of students who attend national STEM conferences.	Detailed Implementation Report; List of students who attended or presented at STEM conferences.	**Spring 2022**	No students have attended a national conference this term.	N/A	No students have attended a national conference this term.	6 students attended a national conference this term.	6 students attended a national conference this term.
			Summer 2022	3 students attended a national conference this term.	No students have attended a national conference this term.	3 students attended a national conference this term.	No students have attended a national conference this term.	6 students attended national conferences this term.
			Fall 2022	No students have attended a national conference this term.	3 students attended a national conference this term.	4 students attended a national conference this term.	5 students attended a national conference this term.	12 students attended national conferences this term.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 8.3: LSAMP students encouraged and supported to submit applications to present research at national STEM conferences.	# of student meetings where students were encouraged to submit applications.	Detailed Implementation Report; Advising Log	**Year 2**	All institutions share information about opportunities on the LSAMP canvas pages maintained by each institution, in STEM club meetings, and in advising meetings.				
	# of student research proposals submitted to national STEM conferences	Detailed Implementation Report; List of students who attended or presented at STEM conferences.	**Year 2**	Data not available at the time of this report.	0 student research proposals submitted to national STEM conferences.	15 student research proposals submitted to national STEM conferences.	Data not available at the time of this report..	15 student research proposals submitted to national STEM conferences.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 8.1: The annual STEM Summit was held on April 15, 2022. The STEM Summit was a 6-hour event, with two blocks of breakout sessions for participants to choose from. Conference components included a keynote session, panels, workshops, and a virtual lab tour. Due to the continuing challenges related to the COVID-19 pandemic, the conference was hosted virtually. STEM Summit was able to engage 53 students across the alliance. Additional attendees included 32 presenters who were not students and 12 faculty/staff members.

SF 8.2: Several conference opportunities were offered to students across the alliance in Year 2. In total, 24 students attended conferences (potentially duplicated students). Conference opportunities offered and the institutions who attended are presented below:

- Florida Undergraduate Research Conference (February 2022): Valencia College
- Community College Innovation Challenge (June 2022): College of Central Florida, Polk College

- Louis Stokes Midwest Regional Center of Excellence Conference (October 2022): Pasco-Hernando State College, Valencia College

- Annual Biomedical Research Conference for Minoritized Scientists (November 2022): Valencia College

SF 8.3: Institutions shared information on conference proposal opportunities through their Canvas shell. Across the alliance at least 15 proposals were submitted.

Table 10. Student Focused Fidelity of Implementation Matrix 9: College and Industry Tours

Notes on SF 9.1-9.4 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 9.1: In-person and virtual lab tours are offered in STEM discipline areas at 4-year research institutions.	# of in-person and virtual lab tours offered	Detailed Implementation Report; List of college and industry tours	**Spring 2022**	2 lab tours were offered in this term.	N/A	2 lab tours were offered in this term.	2 lab tours were offered in this term.	2 lab tours were offered to students.
			Summer 2022	No lab tours were offered in this term.	No lab tours were offered in this term.	4 lab tours were offered in this term.	No lab tours were offered in this term.	5 tours were offered in this term.
			Fall 2022	No lab tours were offered in this term.	No lab tours were offered in this term.	Data not available at the time of report.	No lab tours were offered in this term.	No lab tours were offered in this term.
	# of students who attend in-person and virtual lab tours	Detailed Implementation Report; Rosters from in-person and virtual lab tours	**Spring 2022**	No lab tours were offered in this term.	N/A	7 students attended tours in this term.	3 students attended tours in this term.	10 students attended tours this term.
			Summer 2022	No lab tours were offered in this term.	No lab tours were offered in this term.	40 students attended tours in this term.	3 students attended tours in this term.	43 students attended tours in this term.
			Fall 2022	No lab tours were offered in this term.	No lab tours were offered in this term.	Data not available at the time of report.	No lab tours were offered in this term.	No lab tours were offered in this term.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 9.2: In-person and virtual STEM tours are offered in STEM industry.	# of in-person and virtual STEM industry tours offered	Detailed Implementation Report; List of college and industry tours	**Spring 2022**	No industry tours were offered this term.	N/A	1 STEM industry tour offered this term.	1 STEM industry tour offered this term.	2 STEM industry tours were offered this term.
			Summer 2022	1 STEM industry tour offered this term.	1 STEM industry tour offered this term.	1 STEM industry tour offered this term.	1 STEM industry tour offered this term.	2 STEM industry tours were offered this term.
			Fall 2022	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.
	# of students who attend in-person and virtual STEM industry tours	Detailed Implementation Report; Rosters from in-person and virtual STEM industry tours	**Spring 2022**	No industry tours were offered this term.	N/A	7 students attended the industry tour this term.	2 students attended the virtual industry tour this term.	9 students attended industry tours this term.
			Summer 2022	1 student attended the industry tour this term.	2 students attended the industry tour this term.	9 students attended the industry tour this term.	14 students attended the industry tour this term.	26 students attended industry tours this term..
			Fall 2022	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.	No industry tours were offered this term.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 9.3: Students attend college tours at university partners' institutions.	# of college tours offered	Detailed Implementation Report; List of college and industry tours	**Spring 2022**	1 college tour was offered this term	N/A	No college tours were offered this term.	1 college tour was offered this term.	1 college tour was offered this term.
			Summer 2022	1 college tour was offered this term.	No college tours were offered this term.	No college tours were offered this term.	1 college tour was offered this term.	1 college tour was offered this term.
			Fall 2022	1 college tour was offered this term.	No college tours were offered this term.	No college tours were offered this term.	No college tours were offered this term.	Data only available from one institution.
	# of students who attend college tours	Detailed Implementation Report; Rosters from college tours	**Spring 2022**	3 students attended tours in this term.	N/A	No college tours were offered this term.	6 students attended tours in this term.	9 students attended tours this term.
			Summer 2022	3 students attended tours in this term.	No college tours were offered this term.	No college tours were offered this term.	3 students attended tours this term.	6 students attended tours this term.
			Fall 2022	6 students attended tours in this term.	No college tours were offered this term.	Data not available at the time of report.	No college tours were offered this term.	6 students attended tours this term.
SF 9.4: Students are satisfied with tours.	% of students satisfied with tours	Detailed Implementation Report; Event Feedback Form	**Year 2**	Not available due to limited data in Year 2.				

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 9.1: Lab tours were offered by two institutions in Year 2. There was one tour that happened across three institutions; Valencia College, the College of Central Florida, and Polk State College took students on a lab tour at the Institute for Human & Machine Cognition in May 2022. Other tours were coordinated and taken by a single alliance institution, such as tours of campus labs at Polk State College. It should be noted that some college tours also include lab tours that are not represented in this count as data for these tours were not provided in the Engagement Opportunity Log.

SF 9.2: STEM industry tours were offered by all institutions in Year 2. In total, 35 students (potentially duplicated) attended these tours. Tours included virtual tours (e.g., Barrier Island Center) and in person tours (e.g., Kennedy Space Center, Mote Marine Laboratory and Aquarium).

SF 9.3: College tours were offered by three institutions in Year 2. There was one tour that happened in May 2022 to Florida A & M University. This tour was offered as an alliance-wide opportunity and attended by all institutions with LSAMP members (Pasco-Hernando State College did not have students at the time). In addition, the College of Central Florida visited the University of Central Florida in November 2022.

SF 9.4: Although students did attend college and STEM industry tours, there was only one student response related to these activities in Year 2. Therefore, data are not reported.

Table 11. Student Focused Fidelity of Implementation Matrix 10: LSAMP Research Scholars

Notes on SF 10.1-10.4 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 10.1: LSAMP Research Scholars earn performance-based awards of $500 for semester-long experiences.	Students report financial benefits from award.	Detailed Implementation Report; Roster of LSAMP Research Scholars; Interview/focus group	**Spring 2022**	No students were selected as Research Scholars.	N/A	1 student earned the award.	1 student earned the award.	2 students earned the award.
			Summer 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.
			Fall 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	5 students earned the award.	2 students earned the award.	7 students earned the award.
SF 10.2: LSAMP Research Scholars conduct research either on-campus or through external placements with industry or university partners.	% of LSAMP Research Scholars who conduct research	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	No students were selected as Research Scholars.	N/A	100% of Research Scholars (*n*=1) conducted research.	100% of Research Scholars (*n*=1) conducted research.	100% of Research Scholars (*n*=2) conducted research.
			Summer 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.
			Fall 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	100% of Research Scholars (*n*=5) conducted research.	100% of Research Scholars (*n*=3) conducted research.	100% of Research Scholars (*n*=8) conducted research.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 10.3: LSAMP Research Scholars engage in a minimum of 40 hours of undergraduate research, internships, or lab experiences.	% of LSAMP Research Scholars who engage in at least 40 hours of research	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	No students were selected as Research Scholars.	N/A	100% of Research Scholars (*n*=1) met or exceeded requirement.	100% of Research Scholars (*n*=1) met or exceeded requirement.	100% of Research Scholars (*n*=2) met or exceeded requirement.
			Summer 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.
			Fall 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	100% of Research Scholars (*n*=5) met or exceeded requirement.	67% of Research Scholars (*n*=2) met or exceeded requirement.	88% of Research Scholars (*n*=7) met or exceeded requirement.
SF 10.4: LSAMP Research Scholars present work at the LSAMP Showcase.	% of LSAMP Research Scholars who present work at the LSAMP showcase	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	No students were selected as Research Scholars.	N/A	100% of Research Scholars (*n*=1) presented research.	100% of Research Scholars (*n*=1) presented research.	100% of Research Scholars (*n*=2) presented research.
			Summer 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.	No students were selected as Research Scholars.
			Fall 2022	No students were selected as Research Scholars.	No students were selected as Research Scholars.	100% of Research Scholars (*n*=5) presented research.	No Research Scholars presented their research.	63% of Research Scholars (*n*=5) presented research.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 10.1-10.4: Two institutions (Polk State College and Valencia College) had Research Scholars in Year 2. In total, 10 students were selected as Research Scholars. Of these Research Scholars, 90% (*n*=9) earned performance-based awards, 100% (*n*=10) conducted research, 90% (*n*=9) completed at least 40 hours of research, and 70% (*n*=7) presented their work at the LSAMP Showcase.

Table 12. Student Focused Fidelity of Implementation Matrix 11: LSAMP Community Interns

Notes on SF 11.1-11.3 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 11.1: Community Interns earn awards of $500 upon successful completion of the program.	Students report financial benefits from award.	Detailed Implementation Report; Interview/focus group	**Spring 2022**	No students were selected as Community Interns.	N/A	4 students earned the award.	No students were selected as Community Interns.	Data only available for one institution.
			Summer 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	1 student earned this award.	Data only available for one institution.
			Fall 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.
SF 11.2: Community Interns complete internships with community partners (a minimum of 25 hours).	% of Community Interns who engage in at least 25 hours of internship	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	No students were selected as Community Interns.	N/A	100% of students (*n*=4) met or exceeded requirement.	No students were selected as Community Interns.	Data only available for one institution.
			Summer 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	100% of students (*n*=1) met or exceeded requirement.	Data only available for one institution.
			Fall 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 11.3: Community Interns present internship experiences as artifacts.	% of Community Interns who develop artifacts	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	No students were selected as Community Interns.	N/A	100% of students (*n*=4) developed artifacts.	No students were selected as Community Interns.	Data only available for one institution.
			Summer 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	100% of students (*n*=1) developed artifacts.	Data only available for one institution.
			Fall 2022	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.	No students were selected as Community Interns.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 11.1-11.3: Two institutions (Polk State College and Valencia College) had Community Interns in Year 2. In total, 5 students were selected as Community Interns. Of these Community Interns, 100% (*n*=5) earned performance-based awards, completed at least 25 hours of internship, and presented their work at the LSAMP Showcase.

Table 13. Student Focused Fidelity of Implementation Matrix 12: LSAMP Peer Coaches

Notes on SF 12.1-12.4 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 12.1: Peer Coaches lead/develop workshops and other opportunities for their peers.	% of Peer Coaches who lead/develop workshops and opportunities for peers	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	N/A	N/A	N/A	N/A	N/A
			Summer 2022	No students were selected as Peer Coaches.	N/A	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.
			Fall 2022	No students were selected as Peer Coaches.	N/A	100% of Peer Coaches (*n*=1) led opportunities for peers.	No students were selected as Peer Coaches.	Data only available for one institution.
SF 12.2: Peer Coaches earn awards of $500 upon successful completion of the program.	Students report financial benefits from award.	Detailed Implementation Report; Interview/focus group	**Spring 2022**	N/A	N/A	N/A	N/A	N/A
			Summer 2022	No students were selected as Peer Coaches.	N/A	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.
			Fall 2022	No students were selected as Peer Coaches.	N/A	100% of Peer Coaches (*n*=1) earned the award.	No students were selected as Peer Coaches.	Data only available for one institution.
SF 12.3: Peer Coaches engage in a minimum of 40 hours of peer support.	% of Peer Coaches who engage in at least 40 hours of peer support	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	N/A	N/A	N/A	N/A	N/A
			Summer 2022	No students were selected as Peer Coaches.	N/A	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.
			Fall 2022	No students were selected as Peer Coaches.	N/A	100% of Peer Coaches (*n*=1) met or exceeded the requirement.	No students were selected as Peer Coaches.	Data only available for one institution.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando State College Status	Polk State College Status	Valencia College Status	Alliance Status
SF 12.4: Peer Coaches create capstone presentations which are presented at the LSAMP Showcase.	% of Peer Coaches who create capstone presentations and present at the LSAMP showcase	Detailed Implementation Report; STEM Professionalization Experience Log	**Spring 2022**	N/A	N/A	N/A	N/A	N/A
			Summer 2022	No students were selected as Peer Coaches.	N/A	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.	No students were selected as Peer Coaches.
			Fall 2022	No students were selected as Peer Coaches.	N/A	100% of Peer Coaches (*n*=1) presented capstone presentations.	No students were selected as Peer Coaches.	Data only available for one institution.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

SF 12.1-12.4: This activity requires students to be a LSAMP member for two semesters and to have previously been either a Research Scholar or Community Intern. One student was a Peer Coach at Polk State College. The student met all requirements.

Faculty Focused Fidelity

Table 14. Faculty Focused Fidelity of Implementation Matrix 1: Faculty Development

Notes on FF 1.1 is presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia Status	Alliance Status
FF 1.1: CFSA Paths offers workshops for faculty to support the engagement of URM students in STEM and undergraduate research.	# of workshops offered to faculty	Detailed Implementation Report; Agendas	**Year 2**	No workshops offered in Year 2.				
	# of faculty who participate in workshops	Detailed Implementation Report; Roster of attendees	**Year 2**	No workshops offered in Year 2.				

FF 1.1: The alliance institutions reported that faculty workshops to support the engagement of URM students in STEM and undergraduate research were not offered in Year 2.

Table 15. Faculty Focused Fidelity of Implementation Matrix 2: Faculty Involvement in Co-curricular Activities

Notes on FF 2.1-2.2 are presented after the tables.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia Status	Alliance Status
FF 2.1: Faculty serve as research mentors.	# of workshops offered to faculty	Detailed Implementation Report; Agendas	**Year 2**	No workshops offered in Year 2.				
	% of faculty serving as research mentors	Detailed Implementation Report; Faculty participation log	**Year 2**	N/A	N/A	Data not available at the time of report.	3 faculty members serving as research mentors.	Data only available for one institution.
FF 2.2: Faculty participate in the Summer STEM Institute, STEM Clubs, conferences, field trips, and other activities.	# of faculty who participate in workshops	Detailed Implementation Report; Roster of attendees	**Spring 2022**	10 (potentially duplicated) faculty/staff members participated in activities in Spring 2022.	N/A	56 (potentially duplicated) faculty/staff members participated in activities in Spring 2022.	159 (potentially duplicated) faculty/staff members participated in activities in Spring 2022.	225 (potentially duplicated) faculty/staff members participated in activities in Spring 2022.
			Summer 2022	10 (potentially duplicated) faculty/staff members participated in activities	2 (potentially duplicated) faculty/staff members participated in activities	58 (potentially duplicated) faculty/staff members participated in activities	57 (potentially duplicated) faculty/staff members participated in activities	127 (potentially duplicated) faculty/staff members participated in activities

				in Summer 2022.	in Summer 2022.	in Summer 2022.	in Summer 2022.	in Summer 2022.
			Fall 2022	1 (potentially duplicated) faculty/staff members participated in activities in Fall 2022.	1 (potentially duplicated) faculty/staff members participated in activities in Fall 2022.	73 (potentially duplicated) faculty/staff members participated in activities in Fall 2022.	74 (potentially duplicated) faculty/staff members participated in activities in Fall 2022.	149 (potentially duplicated) faculty/staff members participated in activities in Fall 2022.

Note: Pasco-Hernando State College did not have LSAMP members in Spring 2022.

FF 2.1: Faculty research mentors are part of the LSAMP Research Scholars program. Across the alliance, 3 faculty members served as mentors in Year 2.

FF 2.2: Faculty and staff members were involved in LSAMP activities in Year 2. Numbers of potentially duplicated faculty and staff members are presented in the table above.

Table 16. Faculty Focused Fidelity of Implementation Matrix 3: Faculty Participation in CFSA Work Groups and Implementation Teams

Notes on FF 3.1-3.2 are presented after the table.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia Status	Alliance Status
FF 3.1: CFSA Faculty and Staff participate in CFSA working groups.	% of faculty who participate in CFSA working groups	Detailed Implementation Report; Faculty participation log	**Year 2**	8 faculty and staff members participating in CFSA work groups.	15 faculty and staff members participating in CFSA work groups.	13 faculty and staff members participating in CFSA work groups.	21 faculty and staff members participating in CFSA work groups.	57 faculty and staff members participating in CFSA work groups.
FF 3.2: CFSA Faculty and Staff participate in institution-specific implementation teams.	% of faculty who participate in institution-specific implementation teams	Detailed Implementation Report; Faculty participation log	**Year 2**	All institutions have institution-specific implementation teams.				

FF 3.1: CFSA Work Groups were introduced at the July 2021 Alliance Kick-Off meeting, and institutions selected individuals to serve on each work group. Workgroups were reassigned at the end of Year 2 to minimize duplication of faculty/staff across groups as all alliance institutions had made progress with hiring and identifying staff. The workgroups and number of faculty/staff members on each group are included below:

- Steering Committee: 8 members
- Academic Pathways and Transitions: 10 members
- Assessment and Evaluation: 9 members
- Faculty Programs: 10 members
- Finance/Grants Management: 9 members
- Communications and Marketing: 5 members

- Student Programs: 8 members
- Community Partnerships: 9 members

In total, 57 unique faculty/staff members are involved in CFSA work groups.

FF 3.2: During project staff interviews, it became clear that institution-specific implementation teams were active. All institutions meet on a regular basis with necessary faculty/staff to discuss implementation.

Table 17. Faculty Focused Fidelity of Implementation Matrix 3: Faculty Advocacy and Peer Community

Notes on FF 4.1 are presented after the table.

Activity	Indicator	Data Source	Term	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia Status	Alliance Status
FF 4.1: Faculty across institutions have opportunities to connect.	# of opportunities for faculty across opportunities to connect	Detailed Implementation Report; List of opportunities for faculty across institutions to connect	**Year 2**	In total, 3 Quarterly Alliance Meetings were convened in Year 2. These provided opportunities for faculty to connect. Faculty/staff also connect informally				
	% of faculty who participate in cross-institution programming	Detailed Implementation Report; Roster of attendees	**Year 2**	Data not available for Year 2.				

FF 4.1: In total, 3 Quarterly Alliance Meetings were offered in Year 2. These provided opportunities for faculty to connect. Faculty/staff also connected informally during field trips, conferences, and tours. As the only opportunities in Year 2 were these meetings and events, there is not a specific number of faculty participants because attendance was not taken.

Table 18. Department/Institution Focused Fidelity of Implementation Matrix 1: STEM Articulation and Data Sharing

Notes on DIF 1.1-1.3 are presented after the table.

Activity	Indicator	Data Source	Alliance Status
DIF 1.1: Articulation agreements are developed with expanded university partners.	# of articulation agreements developed with university partners	Detailed Implementation Report; Copies of articulation agreements; Project Staff Interview (Department/Institution Activities)	Articulation agreements with partners were not developed in Year 2
DIF 1.2: Articulate clear STEM degree pathways with university partners.	# of STEM degree pathways developed with university partners	Detailed Implementation Report; Documentation of STEM degree pathways; Project Staff Interview (Department/Institution Activities)	STEM degree pathways with partners were not developed in Year 2
DIF 1.3: Develop data sharing agreements with university partners.	# of data sharing agreements developed with university partners	Detailed Implementation Report; Copies of data sharing agreements; Project Staff Interview (Department/Institution Activities)	Data sharing agreements with partners were not developed in Year 2

DIF 1.1-1.3: The alliance did not expend time on developing articulation agreements, STEM degree pathways, or data sharing agreements in Year 2.

Table 19. Department/Institution Focused Fidelity of Implementation Matrix 2: Data Taskforce

Notes on DIF 2.1 are presented after the table.

Activity	Indicator	Data Source	Alliance Status
DIF 2.1: Assessment and Evaluation group meets regularly.	# of Assessment and Evaluation group meetings	Detailed Implementation Report; Agendas and attendance sheets from assessment and evaluation meetings; Project Staff Interview (Department/Institution Activities)	The Assessment and Evaluation Group worked together during Quarterly Alliance Meeting workgroup time during Year 2.

DIF 2.1: The Assessment and Evaluation group was established in early Fall 2021. The Assessment and Evaluation group supported the evaluator in providing feedback on the General Event Feedback Form and Summer Bridge Feedback form in October 2021. The group was then asked to provide feedback on the series of student surveys in December 2021.

The group members changed throughout the Fall term due to staffing changes. Further, because of hiring challenges, some of the Co-principal Investigators served on the Assessment and Evaluation group in addition to their other responsibilities. As previously noted, workgroup lists were updated in late Year 2. In Year 2, the workgroup primarily focused on discussing response rate challenges and strategies.

Appendix C: Survey and Feedback Form Tables

Summer Bridge Feedback Form

Table 20. Participant Institution

Institution	Frequency	Percentage
College of Central Florida	2	13%
Pasco-Hernando State College	3	20%
Polk State College	3	20%
Valencia College	7	47%
Total	15	

Table 21. Student Reports of Events Led by STEM Professionals or Faculty

Response	Frequency	Percentage
Yes (1)	12	86%
No (2)	2	14%
Total	14	

Table 22. Sessions Led by STEM Professionals or Faculty

Statement	Agreement	Frequency	Percentage
The workshops held my interest.	Strongly Disagree	1	8%
	Disagree	0	0%
	Agree	10	83%
	Strongly Agree	0	0%
	Neither	1	8%
	Strongly Disagree	1	8%

The workshop helped prepare me for college.	Disagree	0	0%
	Agree	10	83%
	Strongly Agree	0	0%
	Neither	1	8%
The workshops made me more interested in STEM careers.	Strongly Disagree	1	8%
	Disagree	0	0%
	Agree	10	83%
	Strongly Agree	0	0%
	Neither	1	8%
The workshops were well organized.	Strongly Disagree	1	8%
	Disagree	0	0%
	Agree	11	92%
	Strongly Agree	0	0%
	Neither	0	0%
Overall, the workshops were of high quality.	Strongly Disagree	1	8%
	Disagree	0	0%
	Agree	11	92%
	Strongly Agree	0	0%
	Neither	0	0%
	Total	12	

Table 23. Student Reports of Hands-on Activities

Response	Frequency	Percentage
Yes	13	100%
No	0	0%
Total	13	

Table 24. Hands-on Activities

Statement	Agreement	Frequency	Percentage
The hands-on STEM activities held my interest.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	54%
	Strongly Agree	6	46%
	Neither	0	0%
The hands-on STEM activities made me more interested in STEM careers.	Strongly Disagree	0	0%
	Disagree	1	8%
	Agree	6	46%
	Strongly Agree	5	38%
	Neither	1	8%
The hands-on STEM activities were well organized.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	54%
	Strongly Agree	6	46%
	Neither	0	0%
Overall, the hands-on STEM activities were of high quality.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	8	62%
	Strongly Agree	5	38%
	Neither	0	0%
	Total	13	

Table 25. Student Reports of STEM Career Pathway Activities

Response	Frequency	Percentage
Yes	12	92%
No	1	8%
Total	13	

Table 26. STEM Career Pathway Activities

Statement	Agreement	Frequency	Percentage
The STEM career pathway activities held my interest.	Strongly Disagree	0	0%
	Disagree	1	8%
	Agree	6	50%
	Strongly Agree	4	33%
	Neither	1	8%
The STEM career pathway activities helped me identify my future STEM career.	Strongly Disagree	0	0%
	Disagree	1	8%
	Agree	7	58%
	Strongly Agree	2	17%
	Neither	2	17%
The STEM career pathway activities were well organized.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	58%
	Strongly Agree	5	42%
	Neither	0	0%
Overall, the STEM career pathway activities were of high quality.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	58%
	Strongly Agree	5	42%
	Neither	0	0%
	Total	12	

Table 27. Student Reports of UN Sustainable Development Goal Project Planning

Response	Frequency	Percentage
Yes	13	100%
No	0	0%
Total	13	

Table 28. UN Sustainable Goal Activities

Statement	Agreement	Frequency	Percentage
I understand the UN Sustainable Development Goals.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	6	46%
	Strongly Agree	6	46%
	Neither	1	8%
Summer Bridge prepared me to develop a project that supported attainment of the UN Sustainable Development Goals in my community.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	54%
	Strongly Agree	6	46%
	Neither	0	0%
I enjoyed developing a project using the UN Sustainable Development Goals in my community.	Strongly Disagree	0	0%
	Disagree	1	8%
	Agree	9	69%
	Strongly Agree	2	15%
	Neither	1	8%
I want to implement the project I developed in my community.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	7	54%
	Strongly Agree	5	38%
	Neither	1	8%
I am more interested in a STEM Career after developing a project that uses the UN Sustainable Development Goals.	Strongly Disagree	0	0%
	Disagree	0	0%
	Agree	6	46%
	Strongly Agree	4	31%
	Neither	3	23%
	Total	13	

Table 29. Student Reports of Institutional Resources and Tools

Response	Frequency	Percentage
Yes	11	92%
No	1	8%
Total	12	

Table 30. Institutional Resources and Tools

Agreement	Frequency	Percentage
Strongly Disagree	0	0%
Disagree	0	0%
Agree	5	45%
Strongly Agree	6	55%
Neither	0	0%
Total	11	

Table 31. Recommendation of Summer Bridge

Likelihood	Frequency	Percentage
Not at all (1)	0	0%
2	0	0%
Probably (3)	0	0%
4	3	25%
Definitely (5)	9	75%
Total	12	

Table 32. Research Self-Efficacy Scale, Average Score

Institution	Number of Students with Complete Response	Mean
All institutions	79	4.16
Polk State	23	3.89
Valencia	47	4.30

Table 33. Confidence in Ability to Excel in Science Major

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
No confidence	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
A little confidence	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
Moderate confidence	21	23.86%	11	47.83%	8	16.67%	0	0.00%	2	40.00%
A lot of confidence	20	22.73%	7	30.44%	11	22.92%	2	40.00%	0	0.00%
Complete confidence	36	40.91%	5	21.74%	26	54.17%	2	40.00%	3	60.00%
Total	88		23		48		5		5	

Table 34. Confidence in Ability to Pursue a Research Science Career

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
No confidence	2	2.27%	1	4.35%	1	2.08%	0	0.00%	0	0.00%
A little confidence	8	9.09%	4	17.39%	4	8.33%	0	0.00%	0	0.00%
Moderate confidence	19	21.59%	6	26.09%	11	22.92%	1	20.00%	1	20.00%
A lot of confidence	23	26.14%	9	39.13%	12	25.00%	1	20.00%	1	20.00%
Complete confidence	27	30.68%	3	13.04%	19	39.58%	2	40.00%	3	60.00%
Total	88		23		48		5		5	

Table 35. Confidence in Ability to Complete a Science Degree

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
No confidence	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
A little confidence	4	4.55%	1	4.35%	2	4.17%	1	20.00%	0	0.00%
Moderate confidence	14	15.91%	6	26.09%	6	12.50%	0	0.00%	2	40.00%
A lot of confidence	18	20.46%	7	30.44%	8	16.67%	2	40.00%	1	20.00%
Complete confidence	42	47.73%	9	33.30%	30	62.50%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 36. Confidence to Persist with Science Courses

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
No confidence	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
A little confidence	6	6.82%	1	4.35%	3	6.25%	1	20.00%	1	20.00%
Moderate confidence	10	11.36%	6	26.09%	4	8.33%	0	0.00%	0	0.00%
A lot of confidence	16	18.18%	4	17.39%	10	20.83%	1	20.00%	1	20.00%
Complete confidence	47	53.41%	12	52.18%	30	62.50%	2	40.00%	3	60.00%
Total	88		23		48		5		5	

Table 37. Confidence to Pursue to a Graduate Degree in Science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
A little confidence	2	2.27%	0	0.00%	1	2.08%	0	0.00%	1	20.00%
Moderate confidence	15	17.05%	6	26.09%	6	12.50%	2	40.00%	0	0.00%
A lot of confidence	23	26.14%	10	43.48%	11	22.92%	1	20.00%	1	20.00%
Complete confidence	39	44.32%	7	30.44%	28	58.33%	1	20.00%	3	60.00%
Total	88		23		48		5		5	

Table 38. Confidence to Complete a Graduate Degree in Science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
A little confidence	3	3.41%	1	4.35%	1	2.08%	1	20.00%	0	0.00%
Moderate confidence	18	20.46%	7	30.44%	8	16.67%	1	20.00%	2	40.00%
A lot of confidence	21	23.86%	7	30.44%	12	25.00%	1	20.00%	1	20.00%
Complete confidence	37	42.05%	8	34.78%	26	54.17%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 39. Participation in a STEM Research Experience Previously

	Frequency	Percent
Yes	14	15.91%
No	66	75.00%
Total	88	

Table 40. Participant in a STEM Research Experience Through LSAMP Institution

	Frequency	Percent
Yes	8	9.09%
No	3	3.41%
Total	88	

Table 41. Sources of Self-Efficacy Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	11	3.81

Table 42. Participant's Ability to Independently Conduct Experiments or Research Projects

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	1	1.14%
Moderately well	1	1.14%
Very well	2	2.27%
Extremely well	7	7.96%
Total	88	

Table 43. Participant's Ability to Analyze Research Data

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	3	3.41%
Very well	2	2.27%
Extremely well	6	6.82%
Total	88	

Table 44. Participant's Ability to Write a Scientific Report

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	3	3.41%
Very well	3	3.41%
Extremely well	5	5.68%
Total	88	

Table 45. Participant's Ability to Prepare a Scientific Poster or Presentation

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	3	3.41%
Very well	2	2.27%
Extremely well	6	6.52%
Total	88	

Table 46. Primary Research Mentor Showed Participant How to Conduct a Research Procedure

Agreement Level	Frequency	Percent
Strongly disagree	0	0.00%
Disagree	1	1.14%
Neither agree nor disagree	2	2.27%
Agree	3	3.41%
Strongly agree	5	5.68%
Total	88	

Table 47. Feel Research Mentor is a Career Role Model

Agreement Level	Frequency	Percent
Strongly disagree	1	1.14%
Disagree	0	0.00%
Neither agree nor disagree	3	3.41%
Agree	2	2.27%
Strongly agree	5	5.68%
Total	88	

Table 48. Research Mentor Encouraged a Research Science Career

Agreement Level	Frequency	Percent
Strongly disagree	0	0.00%
Disagree	0	0.00%
Neither agree nor disagree	2	2.27%
Agree	6	6.82%
Strongly agree	3	3.41%
Total	88	

Table 49. Research Mentor Told Participant They Have the Ability to be a Scientist.

Agreement Level	Frequency	Percent
Strongly disagree	1	1.14%
Disagree	0	0.00%
Neither agree nor disagree	1	1.14%
Agree	4	4.55%
Strongly agree	5	5.68%
Total	88	

Table 50. Participant Felt Nervous When Conducting Research

Agreement Level	Frequency	Percent
Strongly disagree	1	1.14%
Disagree	2	2.27%
Neither agree nor disagree	2	2.27%
Agree	2	2.27%
Strongly agree	4	4.55%
Total	88	

Table 51. Participant Felt Anxious About Ability to do Research.

Agreement Level	Frequency	Percent
Strongly disagree	2	2.27%
Disagree	0	0.00%
Neither agree nor disagree	3	3.41%
Agree	1	1.14%
Strongly agree	5	5.68%
Total	88	

Table 52. A research science career can make a difference in society

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	6	6.82%	2	8.70%	3	6.25%	0	0.00%	1	20.00%
Agree	27	30.68%	10	43.48%	16	33.33%	1	20.00%	0	0.00%
Strongly agree	41	46.59%	8	34.78%	27	56.25%	2	40.00%	4	80.00%
Total	88		23		48		5		5	

Table 53. Research science allows participant to do work they find satisfying

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
Neither agree nor disagree	3	3.41%	1	4.35%	2	4.17%	0	0.00%	0	0.00%
Agree	25	28.41%	11	47.83%	13	27.08%	0	0.00%	1	20.00%
Strongly agree	45	51.14%	8	34.78%	30	62.50%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 54. Research science allows participant to go into a field with high employment demand

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
Neither agree nor disagree	9	10.23%	2	8.70%	7	14.58%	0	0.00%	0	0.00%
Agree	28	31.82%	11	47.83%	16	33.33%	0	0.00%	1	20.00%
Strongly agree	35	39.77%	7	30.44%	21	43.75%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 55. A research science career would allow participant to earn an attractive salary

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
Neither agree nor disagree	7	7.96%	3	13.04%	4	8.33%	0	0.00%	0	0.00%
Agree	23	26.14%	9	39.13%	13	27.08%	0	0.00%	1	20.00%
Strongly agree	42	47.73%	8	34.78%	27	56.25%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 56. Participants' most recent research experience allowed them to feel like a scientist

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	14	15.91%	5	21.74%	8	16.67%	0	0.00%	1	20.00%
Agree	15	17.05%	4	17.39%	9	18.75%	2	40.00%	0	0.00%
Strongly agree	8	9.09%	4	17.39%	3	6.25%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 57. Participants' most recent research experience allowed them to interact with scientists from outside of school

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
Disagree	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
Neither agree nor disagree	22	25.00%	10	43.48%	10	20.83%	1	20.00%	1	20.00%
Agree	7	7.96%	3	13.04%	4	8.33%	0	0.00%	0	0.00%
Strongly agree	5	5.68%	0	0.00%	2	4.17%	1	20.00%	2	20.00%
Total	88		23		48		5		5	

Table 58. Participants' most recent research experience allowed them to feel like part of the scientific community

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	14	15.91%	5	21.74%	8	16.67%	0	0.00%	1	20.00%
Agree	10	11.36%	5	21.74%	5	10.42%	0	0.00%	0	0.00%
Strongly agree	12	13.64%	3	13.04%	5	10.42%	2	40.00%	2	40.00%
Total	88		23		48		5		5	

Table 59. Mentor provided challenging assignments that presented opportunities to learn new skills

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	6	6.82%	1	4.35%	4	8.33%	0	0.00%	1	20.00%
To a small extent	4	4.55%	0	0.00%	3	6.25%	1	20.00%	0	0.00%
To some extent	14	15.91%	3	13.04%	10	20.83%	0	0.00%	1	20.00%
To a large extent	27	30.68%	7	30.44%	17	35.42%	1	20.00%	2	40.00%
To a very large extent	14	15.91%	4	17.39%	8	16.67%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 60. Mentor helped participants meet other people in their field at their college

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	9	10.23%	1	4.35%	7	14.58%	0	0.00%	1	20.00%
To a small extent	8	9.09%	2	8.70%	5	10.42%	1	20.00%	0	0.00%
To some extent	13	14.77%	4	17.39%	7	14.58%	0	0.00%	2	40.00%
To a large extent	18	20.46%	2	8.70%	14	29.16%	1	20.00%	1	20.00%
To a very large extent	17	19.32%	6	26.09%	9	18.75%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 61. Mentor helped participant figure out for themself how to answer a research question

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	13	14.77%	0	0.00%	11	22.92%	0	0.00%	1	20.00%
To a small extent	6	6.82%	0	0.00%	5	10.42%	1	20.00%	1	20.00%
To some extent	17	19.32%	5	21.74%	10	20.83%	0	0.00%	2	40.00%
To a large extent	14	15.91%	3	13.04%	10	20.83%	1	20.00%	0	0.00%
To a very large extent	13	14.77%	5	21.74%	6	12.50%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 62. Mentor helped participant figure out for themself how to understand and explain their research results

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	11	12.50%	1	4.35%	9	18.75%	0	0.00%	1	20.00%
To a small extent	6	6.82%	0	0.00%	4	8.33%	1	20.00%	1	20.00%
To some extent	18	20.46%	5	21.74%	11	22.92%	0	0.00%	2	40.00%
To a large extent	14	15.91%	3	13.04%	10	20.83%	1	20.00%	0	0.00%
To a very large extent	15	17.05%	5	21.74%	8	16.67%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 63. Mentor conveyed empathy for the concerns and feelings participants discussed with them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	6	6.82%	1	4.35%	4	8.33%	0	0.00%	1	20.00%
To a small extent	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
To some extent	14	15.91%	3	13.04%	9	18.75%	0	0.00%	2	40.00%
To a large extent	23	26.14%	5	21.74%	14	29.17%	3	60.00%	1	20.00%
To a very large extent	18	20.46%	5	21.74%	12	25.00%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 64. Mentor provided a consistent place participants could go to for assistance or support

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	7	7.96%	1	4.35%	5	10.42%	0	0.00%	1	20.00%
To a small extent	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
To some extent	8	9.09%	3	13.04%	5	10.42%	0	0.00%	0	0.00%
To a large extent	23	26.14%	5	21.74%	13	27.08%	2	40.00%	3	60.00%
To a very large extent	23	26.14%	5	21.74%	16	33.33%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 65. Mentor encouraged participants to talk openly about anxiety and fears that detract from their work

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	8	9.09%	2	8.70%	4	8.33%	0	0.00%	2	40.00%
To a small extent	7	7.96%	1	4.35%	5	10.42%	0	0.00%	1	20.00%
To some extent	12	13.64%	3	13.04%	8	16.67%	1	20.00%	0	0.00%
To a large extent	19	21.59%	3	13.04%	13	27.08%	2	40.00%	1	20.00%
To a very large extent	17	19.32%	5	21.74%	11	22.92%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 66. Mentor shared personal experiences as an alternative perspective to participants' problems

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	5	5.68%	1	4.35%	2	4.17%	0	0.00%	2	40.00%
To a small extent	6	6.82%	1	4.35%	5	10.42%	0	0.00%	0	0.00%
To some extent	17	19.32%	4	17.34%	12	25.00%	0	0.00%	1	20.00%
To a large extent	17	19.32%	3	13.04%	11	22.92%	2	40.00%	1	20.00%
To a very large extent	18	20.46%	5	21.74%	11	22.92%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 67. Mentor discussed participants' questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and supervisors, or work/family conflicts

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	7	7.96%	2	8.70%	4	8.33%	0	0.00%	1	20.00%
To a small extent	9	10.23%	0	0.00%	9	18.75%	0	0.00%	0	0.00%
To some extent	13	14.77%	3	13.04%	9	18.75%	0	0.00%	1	20.00%
To a large extent	20	22.73%	4	17.39%	13	27.08%	2	40.00%	1	20.00%
To a very large extent	14	15.91%	5	21.74%	6	12.50%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 68. Mentor shared the history of their career

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	7	7.96%	2	8.70%	3	6.25%	0	0.00%	2	40.00%
To a small extent	5	5.68%	0	0.00%	5	10.42%	0	0.00%	0	0.00%
To some extent	17	19.32%	3	13.04%	13	27.08%	0	0.00%	1	20.00%
To a large extent	17	19.32%	4	17.39%	9	18.75%	3	60.00%	1	20.00%
To a very large extent	17	19.32%	5	21.74%	11	22.92%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 69. Mentor encouraged participants to prepare for the next steps in their academic program and/or career

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	5	5.68%	1	4.35%	3	6.25%	0	0.00%	1	20.00%
To a small extent	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
To some extent	6	6.82%	2	8.70%	4	8.33%	0	0.00%	0	0.00%
To a large extent	27	30.68%	6	26.09%	17	35.42%	2	40.00%	2	40.00%
To a very large extent	23	26.14%	5	21.74%	15	31.25%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 70. Mentor listened to participants

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
To a small extent	4	4.55%	0	0.00%	3	6.25%	0	0.00%	1	20.00%
To some extent	11	12.50%	3	13.04%	8	16.67%	0	0.00%	0	0.00%
To a large extent	21	23.86%	6	26.09%	12	25.00%	2	40.00%	1	20.00%
To a very large extent	26	29.55%	5	21.74%	17	35.42%	1	20.00%	3	60.00%
Total	88		23		48		5		5	

Table 71. Mentor serves as a role model

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	4	4.55%	0	0.00%	2	4.17%	0	0.00%	2	40.00%
To a small extent	6	6.82%	2	8.70%	4	8.33%	0	0.00%	0	0.00%
To some extent	13	14.77%	2	8.70%	9	18.75%	1	20.00%	1	20.00%
To a large extent	16	18.18%	4	17.39%	11	22.92%	1	20.00%	0	0.00%
To a very large extent	24	27.27%	6	26.09%	15	31.25%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 72. Mentor displayed attitudes and values similar the participant's attitudes and values

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	3	3.41%	0	0.00%	2	4.17%	0	0.00%	1	20.00%
To a small extent	6	6.82%	2	8.70%	4	8.33%	0	0.00%	0	0.00%
To some extent	15	17.05%	2	8.70%	11	22.92%	0	0.00%	2	40.00%
To a large extent	21	23.86%	5	21.74%	14	29.17%	2	40.00%	0	0.00%
To a very large extent	17	19.32%	4	17.39%	10	20.83%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 73. Mentor helped the participant with a presentation

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	10	11.36%	1	4.35%	7	14.58%	0	0.00%	2	40.00%
To a small extent	7	7.96%	0	0.00%	6	12.50%	0	0.00%	1	20.00%
To some extent	21	23.86%	6	26.09%	13	27.08%	1	20.00%	1	20.00%
To a large extent	12	13.64%	2	8.70%	8	16.67%	2	40.00%	0	0.00%
To a very large extent	13	14.77%	5	21.74%	7	14.58%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 74. Mentor helped participants make an informed decision regarding career options

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	6	6.82%	1	4.35%	4	8.33%	0	0.00%	1	20.00%
To a small extent	3	3.41%	1	4.35%	2	4.17%	0	0.00%	0	0.00%
To some extent	16	18.18%	3	13.04%	12	25.00%	1	20.00%	0	0.00%
To a large extent	21	23.86%	4	17.39%	13	27.08%	1	20.00%	3	60.00%
To a very large extent	17	19.32%	5	21.74%	10	20.83%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 75. Mentor taught participants other specific research skills, or how to do a specific task

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Extent Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all	10	11.36%	1	4.35%	7	14.58%	0	0.00%	2	40.00%
To a small extent	8	9.09%	1	4.35%	5	10.42%	1	20.00%	1	20.00%
To some extent	12	13.64%	2	8.70%	9	18.75%	1	20.00%	0	0.00%
To a large extent	16	18.18%	4	17.39%	11	22.92%	0	0.00%	1	20.00%
To a very large extent	16	18.18%	5	21.74%	9	18.75%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 76. Participant reports of confidence in use of technical science skills

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
To a small extent	6	6.82%	1	4.35%	3	6.25%	1	20.00%	1	20.00%
To some extent	14	15.91%	2	8.70%	10	20.83%	1	20.00%	1	20.00%
To a large extent	30	34.09%	10	43.48%	18	37.50%	1	20.00%	1	20.00%
Absolutely confident	15	17.05%	2	8.70%	11	22.92%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 77. Participant reports of confidence in use of scientific language and terminology

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	6	6.82%	2	8.70%	3	6.25%	0	0.00%	1	20.00%
To a small extent	4	4.55%	1	4.35%	3	6.25%	0	0.00%	0	0.00%
To some extent	11	12.50%	2	8.70%	7	14.58%	1	20.00%	1	20.00%
To a large extent	29	32.96%	7	30.44%	20	41.67%	1	20.00%	1	20.00%
Absolutely confident	16	18.18%	3	13.04%	10	20.83%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 78. Participant reports of confidence to generate a research question to answer

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	3	3.41%	0	0.00%	2	4.17%	0	0.00%	1	20.00%
To a small extent	6	6.82%	3	13.04%	2	4.17%	1	20.00%	0	0.00%
To some extent	20	22.73%	4	17.39%	13	27.08%	1	20.00%	2	40.00%
To a large extent	23	26.14%	5	21.74%	17	35.42%	0	0.00%	1	20.00%
Absolutely confident	14	15.91%	3	13.04%	9	18.75%	1	20.00%	1	20.00%
Total	88		23		48		5		5	

Table 79. Participant reports of confidence to figure out what data/observations to collect and how to collect them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	3	3.41%	0	0.00%	2	4.17%	0	0.00%	1	20.00%
To a small extent	4	4.55%	1	4.35%	2	4.17%	1	20.00%	0	0.00%
To some extent	14	15.91%	5	21.74%	6	12.50%	0	0.00%	3	60.00%
To a large extent	31	35.23%	7	30.44%	22	45.83%	2	40.00%	0	0.00%
Absolutely confident	13	14.77%	2	8.70%	10	20.83%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 80. Participant reports of confidence to analyze data observations

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
To a small extent	7	7.96%	2	8.70%	3	6.25%	1	20.00%	1	20.00%
To some extent	8	9.09%	2	8.70%	4	8.33%	1	20.00%	1	20.00%
To a large extent	31	35.23%	8	34.78%	20	41.67%	1	20.00%	2	40.00%
Absolutely confident	18	20.46%	3	13.04%	14	29.17%	0	0.00%	1	20.00%
Total	88		23		48		5		5	

Table 81. Participant reports of confidence to create explanations for the results of the study

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
To a small extent	2	2.27%	0	0.00%	1	2.08%	1	20.00%	0	0.00%
To some extent	17	19.32%	6	26.09%	8	16.67%	1	20.00%	2	40.00%
To a large extent	28	31.82%	5	21.74%	22	45.83%	1	20.00%	0	0.00%
Absolutely confident	17	19.32%	4	17.39%	11	22.92%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 82. Participant reports of confidence of use of scientific literature to guide research

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	3	3.41%	0	0.00%	3	6.25%	0	0.00%	0	0.00%
To a small extent	7	7.96%	2	8.70%	4	8.33%	1	20.00%	0	0.00%
To some extent	15	17.05%	4	17.39%	8	16.67%	1	20.00%	2	40.00%
To a large extent	20	22.73%	3	13.04%	17	35.42%	0	0.00%	0	0.00%
Absolutely confident	20	22.73%	6	26.09%	11	22.92%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 83. Participant reports of confidence to relate results and explanations to the work of others

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	3	3.41%	1	4.35%	2	4.17%	0	0.00%	0	0.00%
To a small extent	6	6.82%	1	4.35%	4	8.33%	1	20.00%	0	0.00%
To some extent	16	18.18%	3	13.04%	10	20.83%	2	40.00%	1	20.00%
To a large extent	20	22.73%	6	26.09%	13	27.08%	0	0.00%	1	20.00%
Absolutely confident	19	21.59%	4	17.39%	13	27.08%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 84. Participant reports of confidence to develop theories

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
To a small extent	7	7.96%	2	8.70%	4	8.33%	1	20.00%	0	0.00%
To some extent	18	20.49%	4	17.39%	12	25.00%	1	20.00%	1	20.00%
To a large extent	22	25.00%	4	17.39%	16	33.33%	1	20.00%	1	20.00%
Absolutely confident	17	19.32%	5	21.74%	10	20.83%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 85. Participant reports of confidence to report results in an oral presentation or written report

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Confidence Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Not at all confident	3	3.41%	1	4.35%	2	4.17%	0	0.00%	0	0.00%
To a small extent	2	2.27%	0	0.00%	1	2.08%	1	20.00%	0	0.00%
To some extent	15	17.05%	3	13.04%	9	18.75%	2	40.00%	1	20.00%
To a large extent	25	28.41%	7	30.44%	17	35.42%	0	0.00%	1	20.00%
Absolutely confident	19	21.59%	3	13.04%	14	29.17%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 86. Being a scientist is an important part of participant self-image

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	2	2.27%	2	8.70%	0	0.00%	0	0.00%	0	0.00%
Disagree	5	5.68%	2	8.70%	3	6.25%	0	0.00%	0	0.00%
Neither agree nor disagree	11	12.50%	1	4.35%	9	18.75%	0	0.00%	1	20.00%
Agree	22	25.00%	5	21.74%	14	29.17%	1	20.00%	2	40.00%
Strongly agree	25	28.41%	5	21.74%	16	33.33%	2	40.00%	2	40.00%
Total	88		23		48		5		5	

Table 87. Participant possesses a strong sense of belonging to the community of scientists

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	2	2.27%	1	4.35%	1	2.08%	0	0.00%	0	0.00%
Disagree	7	7.96%	1	4.35%	5	10.42%	1	20.00%	0	0.00%
Neither agree nor disagree	15	17.05%	2	8.70%	10	20.83%	1	20.00%	2	40.00%
Agree	22	25.00%	7	30.44%	13	27.08%	1	20.00%	1	20.00%
Strongly agree	19	21.59%	4	17.39%	13	27.08%	0	0.00%	2	40.00%
Total	88		23		48		5		5	

Table 88. Being a scientist is an important reflection of who participant is

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	2	2.73%	1	4.35%	1	2.08%	0	0.00%	0	0.00%
Disagree	7	7.96%	2	8.70%	5	10.42%	0	0.00%	0	0.00%
Neither agree nor disagree	13	14.77%	4	17.39%	8	16.67%	0	0.00%	1	20.00%
Agree	23	26.14%	3	13.04%	16	33.33%	3	60.00%	1	20.00%
Strongly agree	20	22.73%	5	21.74%	12	25.00%	0	0.00%	3	60.00%
Total	88		23		48		5		5	

Table 89. Participant has come to think of themself as a "scientist"'

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	3	3.41%	1	4.35%	2	4.17%	0	0.00%	0	0.00%
Disagree	5	5.68%	3	13.04%	2	4.17%	0	0.00%	0	0.00%
Neither agree nor disagree	19	21.59%	2	8.70%	13	27.08%	2	40.00%	2	40.00%
Agree	20	22.73%	5	21.74%	15	31.25%	0	0.00%	0	0.00%
Strongly agree	18	20.46%	4	17.39%	10	20.83%	1	20.00%	3	60.00%
Total	88		23		48		5		5	

Table 90. Participant is a scientist

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	5	5.68%	3	13.04%	2	4.17%	0	0.00%	0	0.00%
Disagree	5	5.68%	0	0.00%	4	8.33%	0	0.00%	1	20.00%
Neither agree nor disagree	22	25.00%	6	26.09%	13	27.08%	2	40.00%	1	20.00%
Agree	16	18.18%	4	17.39%	11	22.92%	0	0.00%	1	20.00%
Strongly agree	15	17.05%	2	8.70%	10	20.83%	1	20.00%	2	40.00%
Total	88		23		48		5		5	

Table 91. Participant social network includes a lot of scientists and/or science students

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	8	9.09%	1	4.35%	6	12.50%	0	0.00%	1	20.00%
Disagree	9	10.23%	0	0.00%	7	14.58%	1	20.00%	1	20.00%

Table 92. Participant sees the next steps in the field of science and intends to take them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	2	2.27%	0	0.00%	2	4.17%	0	0.00%	0	0.00%
Neither agree nor disagree	5	5.68%	2	8.70%	2	4.17%	1	20.00%	0	0.00%
Somewhat agree	19	21.59%	6	26.09%	10	20.83%	0	0.00%	3	60.00%
Strongly agree	39	44.32%	7	30.44%	28	58.33%	2	40.00%	2	40.00%
Total	88		23		48		5		5	

Table 93. Participant will work as hard as necessary to achieve a career in science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
Neither agree nor disagree	7	7.96%	2	8.70%	5	10.42%	0	0.00%	0	0.00%
Somewhat agree	12	13.64%	4	17.39%	7	14.58%	0	0.00%	1	20.00%
Strongly agree	45	51.14%	9	39.13%	29	60.42%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 94. Participant will work as hard as necessary to achieve a career in science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
Neither agree nor disagree	7	7.96%	2	8.70%	5	10.42%	0	0.00%	0	0.00%
Somewhat agree	12	13.64%	4	17.39%	7	14.58%	0	0.00%	1	20.00%
Strongly agree	45	51.14%	9	39.13%	29	60.42%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 95. Participant expects a career in this field will be very satisfying

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	6	6.82%	0	0.00%	6	12.50%	0	0.00%	0	0.00%
Somewhat agree	17	19.32%	5	21.74%	10	20.83%	0	0.00%	2	40.00%
Strongly agree	42	47.73%	10	43.48%	26	54.17%	3	60.00%	3	60.00%
Total	88		23		48		5		5	

Table 96. Participant feels they are on a definite career path in science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	2	2.27%	1	4.35%	0	0.00%	0	0.00%	1	20.00%
Somewhat disagree	1	1.14%	0	0.00%	1	2.08%	0	0.00%	0	0.00%
Neither agree nor disagree	7	7.96%	3	13.04%	4	8.33%	0	0.00%	0	0.00%
Somewhat agree	16	18.18%	4	17.39%	10	20.83%	1	20.00%	1	20.00%
Strongly agree	40	45.46%	8	34.78%	27	56.25%	2	40.00%	3	60.00%
Total	88		23		48		5		5	

Table 97. Participant definitely wants a career for themself in science

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	6	6.82%	2	8.70%	4	8.33%	0	0.00%	0	0.00%
Somewhat agree	13	14.77%	5	21.74%	7	14.58%	0	0.00%	1	20.00%
Strongly agree	46	52.27%	8	34.78%	31	64.58%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 98. Science is the ideal field of study for the participants' life

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.14%	1	4.35%	0	0.00%	0	0.00%	0	0.00%
Somewhat disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	7	7.96%	3	13.04%	4	8.33%	0	0.00%	0	0.00%
Somewhat agree	15	17.05%	5	21.74%	9	18.75%	0	0.00%	1	20.00%
Strongly agree	43	48.86%	7	30.44%	29	60.42%	3	60.00%	4	80.00%
Total	88		23		48		5		5	

Table 99. School attended during the last academic year

School	Frequency	Percent
High school	15	17.05%
Junior or Community College	43	48.86%
4-year College or University	6	6.82%
Was not in school	5	5.68%
Total	88	

Table 100. Year in college participant is entering in Fall 2022

Year	Frequency	Percent
1st	23	26.14%
2nd	32	36.36%
3rd	9	10.23%
4th	3	3.41%
5th	2	2.27%
Total	88	

Table 101. Current enrollment in a 4-year college

Enrollment	Frequency	Percent
Enrolled	14	15.91%
Not enrolled	55	62.50%
Total	88	

Table 102. Transferred to a 4-year college

Enrollment	Frequency	Percent
Enrolled	1	1.14%
Not enrolled	5	5.68%
Total	88	

Table 103. Declaration of a science or engineering major, past or present

Declaration	Frequency	Percent
Declared a science or engineering major	53	60.23%
Not declared a science or engineering major	15	17.05%
Total	88	

Table 104. Current science or engineering major status

Major status	Frequency	Percent
Currently a science or engineering major	49	55.68%
Not currently a science or engineering major	18	20.87%
Total	88	

Table 105. Plans to graduate as science or engineering major

Graduation status	Frequency	Percent
Planning to graduate as a science or engineering major	60	68.18%
Not planning to graduate as a science or engineering major	6	6.82%
Total	88	

Table 106. Post-graduation plans

Potential degrees	Frequency	Percent across participants
Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)	9	13.43%
Don’t know	14	20.90%
No advanced degree	7	10.45%
Other advanced degree (Please specify)	14	20.90%
Other health-related degree (Please specify)	5	7.46%
Ph.D. in STEM	28	41.79%
Science Teaching Credential for K-12 education	2	2.99%
Total	67	

Table 107. Degrees specified by participants

Other health-related degree
Doctor of Physical Therapy
Doctor of Pharmacy (Pharm. D)
Psychology
Veterinary Medicine
Other advanced degree
Master's Degree
Bachelors Degree in Biomedical Science
Computer Science
Master's Degree in Engineering
Business/Finance
MS and/or Ph.D in STEM
Law Degree
Sustainability
Information Technology
BS in Chemistry
Master's Degree in Data Science

Table 108. Careers participants report considering after graduation

Potential degrees	Frequency	Percent across participants
Don’t know	5	7.46%
Engineering research (or research plus teaching)	20	29.85%
Industry position for engineering	22	32.84%
Industry position for science	15	22.39%
Industry position for technology	18	26.87%
Mathematics research (or research plus teaching)	3	4.48%
Medical practice	12	17.91%
Medical research (or research plus teaching)	12	17.91%
Other career (Please specify)	6	8.96%
Science research (or research plus teaching)	21	31.34%
Teaching science (e.g., K-12 education, community college, four-year college or university)	4	5.97%
Technology research (or research plus teaching)	15	22.39%
Teaching technology (e.g., K-12 education, community college, four-year college or university)	2	2.99%
Teaching engineering (e.g., K-12 education, community college, four-year college or university)	1	1.49%
Teaching mathematics (e.g., K-12 education, community college, four-year college or university)	3	4.48%
Other health profession (Please specify)	3	4.48%
Total	67	

Table 109. Careers specified by participants

Other career
Pharmacy
Environmental lawyer
Spirituality, mental health medical researcher
Astrophysicist
Pilot (Aviation)
Veterinarian
Treatment center director
Cyber Security
Investment Banker, Financial analyst

Table 110. Prior to enrolling in college, participant had personal contact with one or more scientists of the same ethnicity as them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	32	36.36%	5	38.46%	16	42.11%	1	33.33%	2	66.67%
Somewhat disagree	12	13.64%	2	15.39%	8	21.05%	0	0.00%	1	33.33%
Neither agree nor disagree	8	9.09%	1	7.69%	5	13.16%	0	0.00%	0	0.00%
Somewhat agree	7	7.96%	2	15.39%	3	7.90%	1	33.33%	0	0.00%
Strongly agree	6	6.82%	0	0.00%	3	7.90%	0	0.00%	0	0.00%
Total	88		13		38		3		3	

Table 111. Prior to enrolling in college, participant had personal contact with one or more scientists of the same gender as them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	25	28.41%	5	38.46%	11	28.95%	1	33.33%	1	33.33%
Somewhat disagree	7	7.96%	2	15.39%	4	10.53%	0	0.00%	0	0.00%
Neither agree nor disagree	8	9.09%	1	7.69%	4	10.53%	0	0.00%	2	66.67%
Somewhat agree	13	14.77%	2	15.39%	8	21.05%	0	0.00%	0	0.00%
Strongly agree	12	13.64%	0	0.00%	8	21.05%	1	33.33%	0	0.00%
Total	88		13		38		3		3	

Table 112. While in college, participant had personal contact with one or more scientists of the same ethnicity as them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	20	22.73%	2	15.39%	11	28.95%	0	0.00%	2	66.67%
Somewhat disagree	8	9.09%	1	7.69%	5	13.16%	0	0.00%	0	0.00%
Neither agree nor disagree	9	10.23%	1	7.69%	5	13.16%	0	0.00%	1	33.33%
Somewhat agree	15	17.05%	4	30.77%	7	18.42%	1	33.33%	0	0.00%
Strongly agree	13	14.77%	2	15.39%	7	18.42%	1	33.33%	0	0.00%
Total	88		13		38		3		3	

Table 113. While in college, participant had personal contact with one or more scientists of the same gender as them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	16	18.18%	1	7.69%	9	23.68%	0	0.00%	2	66.67%
Somewhat disagree	3	3.41%	1	7.69%	1	2.63%	0	0.00%	0	0.00%
Neither agree nor disagree	11	12.50%	1	7.69%	7	18.42%	0	0.00%	1	33.33%
Somewhat agree	12	13.64%	3	23.01%	6	15.79%	0	0.00%	0	0.00%
Strongly agree	23	26.14%	4	30.77%	12	31.58%	2	66.67%	0	0.00%
Total	88		13		38		3		3	

Table 114. While in college, participant had one or more mentors of the same background as them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	14	15.91%	1	7.69%	9	23.68%	1	33.33%	2	66.67%
Somewhat disagree	8	9.09%	0	0.00%	5	13.16%	0	0.00%	0	0.00%
Neither agree nor disagree	14	15.91%	2	15.39%	7	18.42%	0	0.00%	1	33.33%
Somewhat agree	11	12.50%	4	30.77%	5	13.16%	0	0.00%	0	0.00%
Strongly agree	17	19.32%	3	23.01%	8	21.05%	1	33.33%	0	0.00%
Total	88		13		38		3		3	

Table 115. While in college, participant had one or more mentors who understood how their background contributed to their experience as a science student

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	12	13.64%	2	15.39%	6	15.79%	0	0.00%	1	33.33%
Somewhat disagree	5	5.68%	0	0.00%	5	13.16%	0	0.00%	0	0.00%
Neither agree nor disagree	13	14.77%	1	7.69%	6	15.79%	1	33.33%	1	33.33%
Somewhat agree	19	21.59%	6	46.15%	9	23.68%	0	0.00%	1	33.33%
Strongly agree	15	17.05%	1	7.69%	8	21.05%	1	33.33%	0	0.00%
Total	88		13		38		3		3	

Table 116. When a member of a science team, participant feels it is important to have others who share their background on the team with them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	9	10.23%	1	7.69%	5	13.16%	0	0.00%	0	0.00%
Somewhat disagree	4	4.55%	0	0.00%	2	5.26%	0	0.00%	0	0.00%
Neither agree nor disagree	17	19.32%	1	7.69%	8	21.05%	2	66.67%	1	33.33%
Somewhat agree	16	18.18%	5	38.46%	7	18.42%	0	0.00%	2	66.67%
Strongly agree	17	19.32%	3	23.01%	11	28.95%	0	0.00%	0	0.00%
Total	88		13		38		3		3	

Table 117. When in a leadership role in a science team, participants feel it is important to have others who share their background on the team with them

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	6	6.82%	1	7.69%	2	5.26%	0	0.00%	0	0.00%
Somewhat disagree	7	7.96%	0	0.00%	4	10.53%	0	0.00%	0	0.00%
Neither agree nor disagree	16	18.18%	1	7.69%	8	21.05%	2	66.67%	2	66.67%
Somewhat agree	18	20.46%	3	23.01%	9	23.68%	0	0.00%	1	33.33%
Strongly agree	17	19.32%	5	38.46%	11	28.95%	0	0.00%	0	0.00%
Total	88		13		38		3		3	

Table 118. Participant self-perception as a scientist is compatible with other aspects of their background

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	4	4.55%	1	7.69%	1	2.63%	0	0.00%	0	0.00%
Somewhat disagree	1	1.14%	0	0.00%	1	2.63%	0	0.00%	0	0.00%
Neither agree nor disagree	13	14.77%	5	38.46%	4	10.53%	0	0.00%	1	33.33%
Somewhat agree	25	28.41%	1	7.69%	14	36.84%	2	66.67%	2	66.67%
Strongly agree	21	23.86%	3	23.01%	14	36.84%	0	0.00%	0	0.00%
Total	88		13		38		3		3	

Table 119. Having more people with the participant's background in their field makes them feel more like a scientist

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	7	7.96%	1	7.69%	3	7.90%	0	0.00%	0	0.00%
Somewhat disagree	7	7.96%	0	0.00%	5	13.16%	0	0.00%	0	0.00%
Neither agree nor disagree	9	10.23%	2	15.39%	3	7.90%	1	33.33%	0	0.00%
Somewhat agree	19	21.59%	3	23.01%	9	23.68%	1	33.33%	3	100.00%
Strongly agree	22	25.00%	4	30.77%	14	36.84%	0	0.00%	0	0.00%
Total	88		13		38		3		3	

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Table 120. Confidence in ability to excel in science major over the next two semesters

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	0	0.00%	0	0.00%	0	0.00%
Moderate confidence	5	33.33%	2	20.00%	3	75.00%
A lot of confidence	5	33.33%	4	40.00%	1	25.00%
Complete confidence	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 121. Confidence in ability to pursue a research career

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	1	6.67%	0	0.00%	1	25.00%
A little confidence	2	13.33%	1	10.00%	1	25.00%
Moderate confidence	2	13.33%	1	10.00%	1	25.00%
A lot of confidence	4	26.67%	3	60.00%	1	25.00%
Complete confidence	3	20.00%	3	60.00%	0	0.00%
Total	15		10		4	

Table 122. Confidence in ability to complete a science degree

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	2	13.33%	1	10.00%	0	0.00%
Moderate confidence	1	6.67%	1	10.00%	1	25.00%
A lot of confidence	6	40.00%	3	30.00%	3	75.00%
Complete confidence	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 123. Confidence in ability to persist with science courses even though participant may be a minority in them

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	1	6.67%	1	10.00%	1	10.00%
A little confidence	0	0.00%	0	0.00%	0	0.00%
Moderate confidence	1	6.67%	0	0.00%	0	0.00%
A lot of confidence	6	40.00%	4	40.00%	4	40.00%
Complete confidence	4	26.67%	3	30.00%	3	30.00%
Total	15		10		4	

Table 124. Confidence in ability to pursue a graduate degree in science

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	1	6.67%	1	10.00%	0	0.00%
A little confidence	2	13.33%	0	0.00%	2	50.00%
Moderate confidence	2	13.33%	1	10.00%	1	25.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 125. Confidence in ability to complete a graduate degree in science

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	3	20.00%	1	10.00%	2	50.00%
Moderate confidence	2	13.33%	1	10.00%	1	25.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 126. Participation in a STEM Research Experience previously

	Frequency	Percent
Yes	5	33.33%
No	7	46.67%
Total	15	

Table 127. Participant in a STEM Research Experience through LSAMP institution

	Frequency	Percent
Yes	3	20.00%
No	0	0.00%
Total	15	

Table 128. Participant's ability to independently conduct experiments or research projects

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	0	0.00%
Very well	3	20.00%
Extremely well	1	6.67%
Total	15	

Table 129. Participant's ability to analyze research data

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	1	6.67%
Very well	2	13.33%
Extremely well	1	6.67%
Total	15	

Table 130. Participant's ability to write a scientific report

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	1	6.67%
Very well	2	13.33%
Extremely well	1	6.67%
Total	15	

Table 131. Participant's ability to prepare a scientific poster or presentation

Ability Level	Frequency	Percent
Not well at all	0	0.00%
Somewhat well	0	0.00%
Moderately well	0	0.00%
Very well	2	13.33%
Extremely well	2	13.33%
Total	15	

Table 132. Participant's primary research mentor demonstrated how to conduct a research procedure

	All institutions		Polk State	
Agreement Level	Frequency	Percent	Frequency	Percent
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 133. Participant looks up to their research mentor as a career role model

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 134. Participant's research mentor encouraged the pursuit of a research science career

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 135. Participant's research mentor told participant they have the ability to be a scientist

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 136. Participant felt nervous when conducting research

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 137. Participant felt anxious about their ability to do research

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	4	26.67%	4	40.00%
Strongly Agree	0	0.00%	0	0.00%
Total	15		10	

Table 138. A research science career would allow participant to do work that makes a difference in people's lives or society

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	1	10.00%	0	0.00%
Agree	7	46.67%	3	30.00%	4	100.00%
Strongly Agree	3	20.00%	3	30.00%	0	
Total	15		10		4	

Table 139. A research science career would allow participant to do work that they find satisfying

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	9	60.00%	6	60.00%	3	75.00%
Strongly Agree	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 140. A research science career would allow participant to go into a field with high employment demand

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	3	20.00%	0	0.00%	0	0.00%
Agree	5	33.33%	4	40.00%	3	75.00%
Strongly Agree	2	13.33%	2	20.00%	1	25.00%
Total	15		10		4	

Table 141. A research science career would allow participant to earn an attractive salary

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%
Agree	8	53.33%	4	40.00%	4	100.00%
Strongly Agree	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 142. During most recent research experience, participant felt like a scientist

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	4	26.67%	2	20.00%	2	50.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 143. During most recent research experience, participant interacted with scientists from outside of my school

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	1	6.67%	0	0.00%	1	25.00%
Neither Agree nor Disagree	4	26.67%	2	20.00%	2	50.00%
Agree	1	6.67%	1	10.00%	0	0.00%
Strongly Agree	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 144. During most recent research experience, participant felt part of a scientific community

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	4	26.67%	2	20.00%	2	50.00%
Agree	3	20.00%	1	10.00%	2	50.00%
Strongly Agree	3	20.00%	3	30.00%	0	0.00%
Total	15		10		4	

Table 145. Participant's mentor gave challenging assignments that presented opportunities to learn new skills

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	5	3.33%	3	30.00%	2	50.00%
Agree	4	26.67%	3	30.00%	1	25.00%
Strongly Agree	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 146. Participant's mentor helped them meet other people in their field at the college

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	6	40.00%	3	30.00%	3	75.00%
Agree	3	20.00%	2	20.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 147. Participant's mentor helped them figure out for themselves how to answer a research question

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	5	33.33%	3	30.00%	2	50.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 148. Participant's mentor helped them figure out for themselves how to understand and explain their research results

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	5	33.33%	3	30.00%	2	50.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 149. Participant's mentor conveyed empathy for the concerns and feelings participant discussed with them

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	1	6.67%	0	0.00%	1	25.00%
Neither Agree nor Disagree	5	33.33%	4	40.00%	1	25.00%
Agree	3	20.00%	1	10.00%	2	50.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 150. Participant's mentor provided a consistent place for assistance or support

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	1	6.67%	0	0.00%	1	25.00%
Neither Agree nor Disagree	5	33.33%	4	40.00%	1	25.00%
Agree	3	20.00%	1	10.00%	2	50.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 151. Participant was encouraged by their mentor to openly talk about anxieties and fears that detract from work

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	2	13.33%	0	0.00%	2	50.00%
Disagree	1	6.67%	0	0.00%	1	25.00%
Neither Agree nor Disagree	3	20.00%	3	30.00%	0	0.00%
Agree	3	20.00%	2	20.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 152. Participant's mentor shared personal experiences as an alternative perspective to problems

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	2	13.33%	0	0.00%	2	50.00%
Neither Agree nor Disagree	5	33.33%	4	40.00%	1	25.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 153. Participant's mentor discussed questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and supervisors, or work/family conflicts

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	3	20.00%	1	10.00%	2	50.00%
Neither Agree nor Disagree	4	26.67%	3	30.00%	1	25.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 154. Participant's mentor shared the history of his/her career

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	1	10.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	5	33.33%	2	20.00%	2	50.00%
Agree	3	20.00%	1	10.00%	2	50.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		0	

Table 155. Mentor encouraged participant to prepare for the next steps in your academic program and/or career

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	5	33.33%	3	30.00%	2	50.00%
Agree	4	26.67%	2	20.00%	2	50.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 156. Mentor listened when participant spoke

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	5	33.33%	4	40.00%	1	25.00%
Agree	4	26.67%	1	10.00%	3	75.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		0	

Table 157. Mentor served as a role model

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	1	6.67%	0	0.00%	1	25.00%
Neither Agree nor Disagree	6	40.00%	4	40.00%	2	50.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 158. Mentor displayed attitudes and values similar to participant's attitudes and values

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	6	40.00%	3	30.00%	3	75.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 159. Mentor helped participant with a presentation (either at institution or at a conference)

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	1	10.00%	2	50.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	4	26.67%	3	30.00%	1	25.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 160. Mentor helped participant make an informed decision regarding career options

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	5	3.33%	3	30.00%	2	50.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 161. Mentor taught participant other specific research skills, or how to do a specific task

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	2	13.33%	1	10.00%	1	25.00%
Neither Agree nor Disagree	4	26.67%	3	30.00%	1	25.00%
Agree	2	13.33%	1	10.00%	1	25.00%
Strongly Agree	2	13.33%	2	20.00%	0	0.00%
Total	15		10		4	

Table 162. Participant can use technical science skills (use of tools, instruments, and/or techniques)

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	0	0.00%	0	0.00%	0	0.00%
Moderate confidence	6	40.00%	3	30.00%	2	50.00%
A lot of confidence	4	26.67%	3	30.00%	2	50.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 163. Participant can use scientific language and terminology

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	1	6.67%	0	0.00%	1	25.00%
Moderate confidence	4	26.67%	3	30.00%	1	25.00%
A lot of confidence	5	33.33%	3	30.00%	2	50.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 164. Participant can generate a research question to answer

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	1	6.67%	0	0.00%	1	25.00%
A little confidence	2	13.33%	0	0.00%	2	50.00%
Moderate confidence	4	26.67%	4	40.00%	0	0.00%
A lot of confidence	3	20.00%	2	20.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 165. Participant can figure out what data/observations to collect and how to collect them

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	1	6.67%	0	0.00%	1	25.00%
Moderate confidence	5	33.33%	3	30.00%	2	50.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 166. Participant can figure out/analyze what data/observations mean

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	3	20.00%	1	10.00%	2	50.00%
Moderate confidence	3	20.00%	2	20.00%	1	25.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 167. Participant can create explanations for the results of the study

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	2	13.33%	0	0.00%	2	50.00%
Moderate confidence	4	26.67%	3	30.00%	1	25.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 168. Participant can use scientific literature and/or reports to guide research

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	3	20.00%	0	0.00%	3	75.00%
Moderate confidence	3	20.00%	3	30.00%	0	0.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 169. Participant can relate results and explanations to the work of others

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	4	26.67%	1	10.00%	3	75.00%
Moderate confidence	2	13.33%	2	20.00%	0	0.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 170. Participant can develop theories (integrate and coordinate results from multiple studies)

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	3	20.00%	0	0.00%	3	75.00%
Moderate confidence	3	20.00%	3	30.00%	0	0.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 171. Participant can report research results in an oral presentation or written report

	All institutions		Polk State		PHSC	
Confidence Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No confidence	0	0.00%	0	0.00%	0	0.00%
A little confidence	2	13.33%	0	0.00%	2	50.00%
Moderate confidence	4	26.67%	3	30.00%	1	25.00%
A lot of confidence	4	26.67%	3	30.00%	1	25.00%
Complete confidence	1	6.67%	1	10.00%	0	0.00%
Total	15		10		4	

Table 172. Being a scientist is an important part of participant self-image

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	3	20.00%	1	10.00%	2	50.00%
Agree	3	20.00%	3	30.00%	0	0.00%
Strongly Agree	3	20.00%	2	20.00%	1	25.00%
Total	15		10		4	

Table 173. Participant possesses a strong sense of belonging to the community of scientists

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	2	13.33%	1	10.00%	1	25.00%
Neither Agree nor Disagree	2	13.33%	0	0.00%	2	50.00%
Agree	3	20.00%	3	30.00%	0	0.00%
Strongly Agree	4	26.67%	3	30.00%	1	25.00%
Total	15		10		4	

Table 174. Being a scientist is an important reflection of who participant is

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	3	20.00%	1	10.00%	2	50.00%
Agree	3	20.00%	3	30.00%	0	0.00%
Strongly Agree	3	20.00%	2	20.00%	1	25.00%
Total	15		10		4	

Table 175. Participant has come to think of themself as a "scientist"

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	4	26.67%	2	20.00%	2	50.00%
Agree	2	13.33%	2	20.00%	0	0.00%
Strongly Agree	3	20.00%	2	20.00%	1	25.00%
Total	15		10		4	

Table 176. Participant is a scientist

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	2	13.33%	0	0.00%	2	50.00%
Disagree	1	6.67%	1	10.00%	0	0.00%
Neither Agree nor Disagree	3	20.00%	2	20.00%	1	25.00%
Agree	2	13.33%	2	20.00%	0	0.00%
Strongly Agree	3	20.00%	2	20.00%	1	25.00%
Total	15		10		4	

Table 177. Participant social network includes a lot of scientists and/or science students

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	1	6.67%	0	0.00%	1	25.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	3	20.00%	1	10.00%	2	50.00%
Agree	3	20.00%	3	30.00%	0	0.00%
Strongly Agree	4	26.67%	3	30.00%	1	25.00%
Total	15		10		4	

Table 178. Participant intends to work in a job related to science

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	6	40.00%	4	40.00%	2	50.00%
Strongly Agree	4	26.67%	3	30.00%	1	25.00%
Total	15		10		4	

Table 179. Participant sees the next steps in the field of science and intends to take them

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	6	40.00%	5	50.00%	1	25.00%
Strongly Agree	4	26.67%	2	20.00%	2	50.00%
Total	15		10		4	

Table 180. Participant will work as hard as necessary to achieve a career in science

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	4	26.67%	4	40.00%	0	0.00%
Strongly Agree	6	40.00%	3	30.00%	3	75.00%
Total	15		10		4	

Table 181. Participant expects a career in science will be very satisfying

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	4	26.67%	4	40.00%	0	0.00%
Strongly Agree	6	40.00%	3	30.00%	3	75.00%
Total	15		10		4	

Table 182. Participant feels they are on a definite career path in science

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	5	33.33%	4	40.00%	1	25.00%
Strongly Agree	5	33.33%	3	30.00%	2	50.00%
Total	15		10		4	

Table 183. Participant definitely wants a career for themself in science

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	5	33.33%	4	40.00%	1	25.00%
Strongly Agree	5	33.33%	3	30.00%	2	50.00%
Total	15		10		4	

Table 184. Science is the ideal field of study for the participant's life

	All institutions		Polk State		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	6.67%	0	0.00%	1	25.00%
Agree	4	26.67%	4	40.00%	0	0.00%
Strongly Agree	6	40.00%	3	30.00%	3	75.00%
Total	15		10		4	

Table 185. School attended during the last academic year

School	Frequency	Percent
High school	3	20.00%
Junior or Community College	6	40.00%
4-year College or University	2	13.33%
Was not in school	0	0.00%
Total	15	

Table 186. Year in college participant is entering in Fall 2022

Year	Frequency	Percent
1st	3	20.00%
2nd	4	26.67%
3rd	1	6.67%
4th	3	20.00%
5th	0	0.00%
Total	15	

Table 187. Current enrollment in a 4-year college

Enrollment	Frequency	Percent
Enrolled	4	26.67%
Not enrolled	7	46.67%
Total	15	

Table 188. Transferred to a 4-year college

Enrollment	Frequency	Percent
Enrolled	0	0.00%
Not enrolled	2	13.33%
Total	15	

Table 189. Declaration of a science or engineering major, past or present

Declaration	Frequency	Percent
Declared a science or engineering major	7	46.67%
Not declared a science or engineering major	3	20.00%
Total	15	

Table 190. Current science or engineering major status

Major status	Frequency	Percent
Currently a science or engineering major	8	53.33%
Not currently a science or engineering major	2	13.33%
Total	15	

Table 191. Plans to graduate as science or engineering major

Graduation status	Frequency	Percent
Planning to graduate as a science or engineering major	10	66.67%
Not planning to graduate as a science or engineering major	0	0.00%
Total	15	

Table 192. Post-graduation plans

Potential degrees	Frequency	Percent across participants
Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)	5	33.33%
Don’t know	3	20.00%
No advanced degree	1	6.67%
Other advanced degree (Please specify)	1	6.67%
Other health-related degree (Please specify)	3	20.00%
Ph.D. in STEM	3	20.00%
Science Teaching Credential for K-12 education	0	0.00%
Total	15	

Table 193. Other degrees specified by participants

Other health-related degree
Doctor of Medicine in Dentistry

Table 194. Careers participants report considering after graduation (*n*=15)

Potential degrees	Frequency	Percent across participants
Don't know	1	6.67%
Engineering research (or research plus teaching)	1	6.67%
Industry position for engineering	4	26.67%
Industry position for science	1	6.67%
Industry position for technology	1	6.67%
Mathematics research (or research plus teaching)	0	0.00%
Medical practice	3	20.00%
Medical research (or research plus teaching)	3	20.00%
Other career (Please specify)	0	0.00%
Science research (or research plus teaching)	2	13.33%
Teaching science (e.g., K-12 education, community college, four-year college or university)	0	0.00%
Technology research (or research plus teaching)	1	6.67%
Teaching technology (e.g., K-12 education, community college, four-year college or university)	0	0.00%
Teaching engineering (e.g., K-12 education, community college, four-year college or university)	0	0.00%
Teaching mathematics (e.g., K-12 education, community college, four-year college or university)	0	0.00%
Other health profession (Please specify)	2	13.33%
Total	15	

Table 195. Careers specified by participants

Other career
Dentist

Table 196. Participated in STEM advising

	Frequency	Percent
Yes	8	57.14%
No	6	42.86%
Total	14	

Table 197. Participant's advisor answers questions

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	2	14.29%	2	40.00%	0	0.00%	0	0.00%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 198. If participant's advisor does not know the answer to participant’s questions, their advisor makes the effort to connect the participant with someone who does

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%	0	0.00%	0	0.00%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 199. Availability of the academic advisor currently meets participant's needs

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	2	14.29%	2	40.00%	0	0.00%	0	0.00%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 200. Participant's advisor listens and respects participant as an individual

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	2	14.29%	2	40.00%	0	0.00%	0	0.00%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 201. Participant is given the time they need during appointments and does not feel rushed

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	2	14.29%	2	40.00%	0	0.00%	0	0.00%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 202. Academic advisor if knowledgeable about careers that apply to participant's major

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	2	14.29%	1	20.00%	0	0.00%	1	14.29%
Strongly Agree	5	35.71%	1	20.00%	1	50.00%	3	42.86%
Total	14		5		2		7	

Table 203. Participant would recommend academic advisor to other students

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%	0	0.00%	0	0.00%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 204. Overall, participant is satisfied with STEM academic advising received

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%	0	0.00%	0	0.00%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 205. Participated as a Community Intern.

	Frequency	Percent
Yes	1	7.14%
No	11	78.57%
Total	14	

Table 206. Participating as a LSAMP Community Intern was an enjoyable experience

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	7.14%	1	20.00%
Agree	0	0.00%	0	0.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 207. Participating as a LSAMP Community Intern made participant more interested in pursuing a STEM degree

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 208. Participating as a LSAMP Community Intern made participant more interested in pursuing a STEM career

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 209. Participating as a LSAMP Community Intern helped participant gain valuable skills I would not have gained otherwise

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 210. Participating as a LSAMP Community Intern provided participant with professional connections they would not have gained otherwise

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 211. After participating as a LSAMP Community Intern, participant better understood how a STEM career could make a difference in the community

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 212. After participating as a LSAMP Community Intern, participant better understood how social justice was linked to STEM

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 213. After participating as a LSAMP Community Intern, participant is motivated to work in a STEM career where they can make a difference in the community

	All institutions		Polk State	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%
Agree	1	7.14%	1	20.00%
Strongly Agree	0	0.00%	0	0.00%
Total	14		5	

Table 214. The monetary award provided to LSAMP Community Interns…

	All institutions		Polk State	
Statements	**Frequency**	**Percent**	**Frequency**	**Percent**
Allowed participant to not hold a job	0	0.00%	0	0.00%
Allowed participant to work less hours	1	7.14%	1	20.00%
Helped participant stay enrolled	1	7.14%	1	20.00%
Total	14		5	

Table 215. Participating in LSAMP activities makes participant feel more connected to their institution

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	4	28.57%	2	40.00%	0	0.00%	2	28.57%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 216. Participating in LSAMP activities makes participant feel more connected to peers with similar interests

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	7.14%	0	0.00%	0	0.00%	1	14.29%
Agree	4	28.57%	2	40.00%	0	0.00%	2	28.57%
Strongly Agree	5	35.71%	1	20.00%	1	50.00%	3	42.86%
Total	14		5		2		7	

Table 217. Participating in LSAMP activities makes participant feel connected to their intended field of study

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	5	35.71%	3	60.00%	0	0.00%	2	28.57%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 218. Participating in LSAMP activities has helped participant build STEM skills

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	5	35.71%	3	60.00%	0	0.00%	2	28.57%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 219. Participating in LSAMP activities has helped participant build connections/network at my institution

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	4	28.57%	2	40.00%	0	0.00%	2	28.57%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 220. Participating in LSAMP activities has helped participant build connections/network at other institutions

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	4	28.57%	2	40.00%	0	0.00%	2	28.57%
Strongly Agree	6	42.86%	1	20.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 221. Participating in LSAMP activities has helped participant develop their identity in STEM (e.g., scientist, mathematician, engineer)

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	2	14.29%	1	20.00%	0	0.00%	1	14.29%
Agree	3	21.43%	2	40.00%	0	0.00%	1	14.29%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

Table 222. Participating in LSAMP activities has helped participant explore STEM careers

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Agree	4	28.57%	3	60.00%	0	0.00%	1	14.29%
Strongly Agree	6	42.86%	0	0.00%	1	50.00%	5	71.43%
Total	14		5		2		7	

Table 223. Participating in LSAMP activities has helped participant decide on a future career path

	All institutions		Polk State		Valencia		PHSC	
Agreement Level	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Strongly Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither Agree nor Disagree	1	7.14%	1	20.00%	0	0.00%	0	0.00%
Agree	4	28.57%	2	40.00%	0	0.00%	2	28.57%
Strongly Agree	5	35.71%	0	0.00%	1	50.00%	4	57.14%
Total	14		5		2		7	

General Student Event Feedback Form

Table 224. Event Leader

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Leader Type	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Students	1	1.79%	1	20.00%	0	0.00%	0	0.00%	0	0.00%
Staff or Faculty	25	44.64%	1	20.00%	20	46.51%	2	40.00%	2	66.67%
STEM Professional	10	17.86%	0	0.00%	10	23.26%	0	0.00%	0	0.00%
Combination of Staff/faculty, students and/or STEM professionals	16	28.57%	2	40.00%	11	25.58%	2	40.00%	1	33.33%
Other	3	5.36%	1	20.00%	2	4.65%	0	0.00%	0	0.00%
Unsure	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	56		5		43		5		3	

Table 225. Event Type

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Event Type	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
STEM Skill Building Workshop	15	26.79%	3	60.00%	12	27.91%	0	0.00%	0	0.00%
Informal Support Session	3	5.36%	0	0.00%	2	4.65%	0	0.00%	1	33.33%
Study Group	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Tutoring	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
STEM Career Activity	6	10.71%	1	20.00%	4	9.30%	0	0.00%	1	33.33%
STEM Identity Activity	2	3.57%	1	20.00%	1	2.33%	0	0.00%	0	0.00%
Networking Activity	7	12.50%	0	0.00%	6	13.95%	1	20.00%	0	0.00%
STEM Summit Conference	2	3.57%	0	0.00%	2	4.65%	0	0.00%	0	0.00%
Lab Tour	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Industry Tour	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
College Tour	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Other	20	35.71%	0	0.00%	16	37.21%	3	60.00%	1	33.33%
Total	56		5		43		5		3	

Table 226. Would participants recommend the event they attended

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Recommendation Rating	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Average	9.02		9.60		8.79		10.00		10.00	
1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
3	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
4	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
5	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
6	3	5.36%	0	0.00%	3	6.98%	0	0.00%	0	0.00%
7	2	3.57%	0	0.00%	2	4.65%	0	0.00%	0	0.00%
8	7	12.50%	0	0.00%	7	16.28%	0	0.00%	0	0.00%
9	9	16.07%	2	40.00%	7	16.28%	0	0.00%	0	0.00%
10	32	57.14%	3	60.00%	22	51.16%	4	80.00%	3	100.00%
Total	56		5		43		5		3	

Table 227. The event's topic was relevant to participant

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	16	28.57%	3	60.00%	11	25.58%	1	20.00%	1	33.33%
Agree	37	66.07%	2	40.00%	31	72.09%	2	40.00%	2	66.67%
Strongly agree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	56		5		43		5		3	

Table 228. The instructor(s) or event leader(s) were knowledgeable

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	13	23.21%	2	40.00%	10	23.26%	1	20.00%	0	0.00%
Agree	41	73.21%	3	60.00%	32	74.42%	3	60.00%	3	100.00%
Strongly agree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	56		5		43		5		3	

Table 229. The event held the participant's interest

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	2	3.57%	0	0.00%	2	4.65%	0	0.00%	0	0.00%
Neither agree nor disagree	14	25.00%	2	40.00%	10	23.26%	2	40.00%	0	0.00%
Agree	37	66.07%	3	60.00%	30	69.77%	2	40.00%	2	66.67%
Strongly agree	1	1.79%	0	0.00%	0	0.00%	0	0.00%	1	33.33%
Total	56		5		43		5		3	

Table 230. The event was well organized

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	16	28.57%	2	40.00%	12	27.91%	1	20.00%	1	33.33%
Agree	38	67.86%	3	60.00%	30	69.77%	3	60.00%	2	66.67%
Strongly agree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total	56		5		43		5		3	

Table 231. This event increased the participant's interest in STEM

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Neither agree nor disagree	10	17.86%	2	40.00%	8	18.60%	0	0.00%	0	0.00%
Agree	37	66.07%	3	60.00%	28	65.12%	4	80.00%	2	66.67%
Strongly agree	3	5.36%	0	0.00%	2	4.65%	0	0.00%	1	33.33%
Total	56		5		43		5		3	

Table 232. This event made the participant feel supported

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Agreement Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Strongly disagree	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
Disagree	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Neither agree nor disagree	10	17.86%	2	40.00%	7	16.28%	0	0.00%	1	33.33%
Agree	37	66.07%	3	60.00%	28	65.12%	4	80.00%	2	66.67%
Strongly agree	4	7.14%	0	0.00%	4	9.30%	0	0.00%	0	0.00%
Total	56		5		43		5		3	

Table 233. Overall Event Rating

	All institutions		Polk State		Valencia		College of Central Florida		PHSC	
Overall Event Ratings	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Average	4.55		4.40		4.53		4.75		4.67	
1	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
2	1	1.79%	0	0.00%	1	2.33%	0	0.00%	0	0.00%
3	4	7.14%	1	20.00%	3	6.98%	0	0.00%	0	0.00%
4	14	25.00%	1	20.00%	11	25.58%	1	20.00%	1	33.33%
5	36	64.29%	3	60.00%	28	65.12%	3	60.00%	2	66.67%
Total	56		5		43		5		3	