



Central Florida STEM Alliance Paths to Engagement

Year 1 Annual Report
April 2022

Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate:

Central Florida STEM Alliance Paths to Engagement

Year 1 Annual Report

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Executive Summary

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridges to the Baccalaureate (B2B) funding from the National Science Foundation, commissioned Shaffer Evaluation Group to conduct an evaluation of the project across the funding period. Below is a summary of findings from the first semester of implementation.

Student Focused Activities

- The alliance successfully recruited 99 students across three institutions in Fall 2021. Pasco-Hernando State College, the newest member of the alliance, did not recruit and instead focused on preparing for implementation in Spring 2022. Of the 99 students recruited, 74% belonged to racially and ethnically minoritized groups. The majority of students identified as Hispanic ($n=44$) or Black ($n=29$) and were female (55%, $n=26$).¹
- To remain an LSAMP member, students are required to meet with their advisor at least once per semester, participate in at least 3 LSAMP activities or programs per semester, and complete LSAMP orientation in their first semester. Across the alliance, 72% of students ($n=86$) completed orientation, 95% of students ($n=110$) met with their advisor at least one time, and 35% of students ($n=52$) participated in three or more activities.²
- Alliance institutions offered a variety of engagement opportunities, despite staffing challenges and a later start in October 2021. In Fall 2021, 45 different opportunities were offered across the alliance. Eighty-two percent of these opportunities ($n=37$) were offered virtually across the alliance. Project staff reported the majority of courses at their institutions were offered virtually or in a hybrid format, so many students needed virtual opportunities for program engagement.

Faculty and Department/Institution Focused Activities

- Project leaders chose to prioritize student-focused activities during Fall 2021, thus delaying implementation of faculty and department/institution focused activities.
- Faculty were involved in student activities, with 108 (potentially duplicated) faculty members participating across the alliance.
- CFSA Work Groups were introduced at the July 2021 Alliance Kick-Off meeting and institutions selected individuals to serve on each work group. However, most work groups were not convened in Fall 2021 and were scheduled to begin meeting in March 2022. The evaluation work group collaborated via email in Fall 2021.

¹ Gender information was available for 47 of the 99 students. One institution did not provide this information.

² There were 99 official LSAMP members in Fall 2021. However, some institutions provided data for students who were served by advisors or in the STEM Club and were not LSAMP members. In some instances, up to 150 students are reported.

Successes

- LSAMP recruitment was a success in the first semester of implementation, particularly considering the challenges of engaging students when a large percentage of students continued their courses in virtual/hybrid modality because of ongoing effects of the pandemic.
- All institutions had at least 90% of students meet with their advisors during Fall 2021. This is particularly impressive considering two of the three institutions with LSAMP members had difficulty filling all academic advisor roles in Fall 2021. Students spoke positively of the advisors and their role in their LSAMP experience.
- Significant progress was made with establishing meetings and procedures, both alliance-wide and by institution. Monthly Conversations are attended by the co-principal investigator at each institution, the Project Director, Valencia's Director of Grant Compliance, and the external evaluator. Quarterly Alliance Meetings are held once a quarter and include all involved project staff members and other alliance partners. Finally, CFSA working groups have been established and began meeting in March 2022.

Challenges and Internal/External Factors

- The biggest challenges in Fall 2021 were related to staffing. An Interim Project Director was in place for the majority of Fall 2021. Although a Project Director was hired, this staff member ultimately accepted a position at another institution and a permanent Project Director has not been able to be found as of March 2022. Further, three of the four institutions had difficulty filling all advisor roles. These staffing challenges affected project implementation at the institutions, broader alliance-wide conversations and activities, and student recruitment and engagement. At the end of Fall 2021, advising positions were filled at two of four institutions. In addition, Valencia has restructured roles to ensure more support for the Interim Project Director position as the search for a Project Director continues.
- The COVID-19 pandemic continued to cause challenges in Fall 2021 ranging from programming impacts, challenges engaging faculty, and issues for student engagement through lack of technology/internet access and Zoom fatigue³ (i.e., a feeling of exhaustion after attending a video call).

Sustainability

- The new LSAMP grant has increased cross-institution collaboration at higher levels. January 2022 held the first Governing Board Meeting which included the presidents of all four institutions. Meetings will be held twice each year in January and May. The commitment of the presidents to continue meeting and planning is a sustainable action.

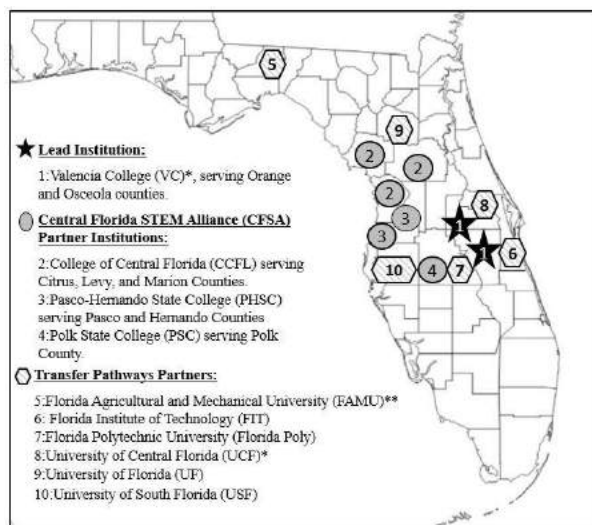
³ <https://news.stanford.edu/2021/02/23/four-causes-zoom-fatigue-solutions/>



Chapter One: Introduction

Project Background

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridges 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 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 utilizing 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).

Program Design

The program focuses on strengthening URM students' sense of belonging and deepening their engagement in STEM. The program uses an activity framework designed to build levels of involvement and 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. Descriptions of each are included below.

Summer Bridge Program

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. Throughout 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 and societal challenges by learning about the UN Sustainable Development Goals (UN-SDGs) and developing project that support attainment of the UN-SDGs in their local communities.

As part of the Summer Bridge experience, the project ensures students have 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.

The Summer STEM Institute will begin in Summer 2022.

Student Recruitment and Engagement

The program is implementing a strategy to recruit and engage all new LSAMP students in workshops and learning opportunities that foster their STEM socialization, professionalization and academic success. As part of this, 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.

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; 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 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.

Further, the program 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.

STEM Identity, Professional Experiences, and Conferences

The program 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.

The program will also 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. LSAMP Scholars will be encouraged and supported to submit applications to present their research at such conferences.

Finally, the program 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.

STEM Professionalization Experiences through Paths to Engagement

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

LSAMP Research Scholars: CFSA will deepen the engagement of URM students in STEM undergraduate research experiences through an LSAMP Scholars Program that incentivizes 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 experience lasts for one semester 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 highlighting their STEM Story and present these at the LSAMP Showcase.

STEM professionalization experiences will be offered beginning in Spring 2022.

Faculty Focused Activities

Faculty focused activities are comprised of two primary areas. Descriptions of each are included below.

Diversity and Inclusion in STEM

The project will offer faculty development opportunities to support the engagement of URM students in STEM and undergraduate research, which may include workshops related to equity, inclusion, growth mindset, engagement strategies for a virtual setting, or other topics related to engaging diverse learners in STEM. Virtual resources will promote faculty and staff across CFSA institutions to participate in professional development.

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: Co-curricular activities will include faculty engagement as research mentors, as well as participation in the Summer STEM Institute, STEM Clubs, conferences, field trips and other activities.

CFSA Work Groups and Implementation Teams: CFSA faculty and staff will participate in CFSA working groups related to their project role, and their institutional-specific LSAMP implementation teams will inform decision-making and programmatic planning for the CFSA.

Faculty Advocacy and Peer Community: The project will offer opportunities for faculty across the CFSA to connect and learn from one another. This may include engaging CFSA faculty and staff in discussions and information sharing regarding research mentoring to support those faculty who are serving as mentors for the first time. Technology will be utilized to allow faculty and staff mentors across the Alliance the opportunity to participate.

Department/Institution Focused Activities

Department/Institution focused activities are comprised of two primary areas. Descriptions of each are included below.

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 Workgroup consists of representatives from partner institutions who are developing data sharing agreements that align definitions and data reporting systems to accurately account for and identify URM students in STEM pathways. This workgroup meets regularly, is supported by the project's PI, Co-PIs, Steering Committee, and Institutional Research Offices.

Current Project Status

During the time period of July 2021-February 2022, the first part of Year 1, the alliance made progress with implementation despite staffing challenges faced by all institutions. The College of Central Florida, Polk State, and Valencia built on the momentum from the prior grant, recruiting LSAMP members, establishing and revitalizing STEM Clubs, providing advising opportunities for students, and coordinating opportunities for LSAMP member. Pasco-Hernando, new to the alliance, focused on launching the LSAMP program at their institution, including hiring staff members, planning for recruitment, and building institutional capacity. More details on project implementation are discussed in the findings section of this report.

Study Design

The SEG study design includes (a) process evaluation to monitor fidelity of implementation and provide program feedback; and (b) outcome/effectiveness evaluation to determine progress in the intended outcomes of the project. The process evaluation monitors activity-level (i.e., student focused, faculty focused, department/institution focused) indicators, 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.

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.
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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.⁴

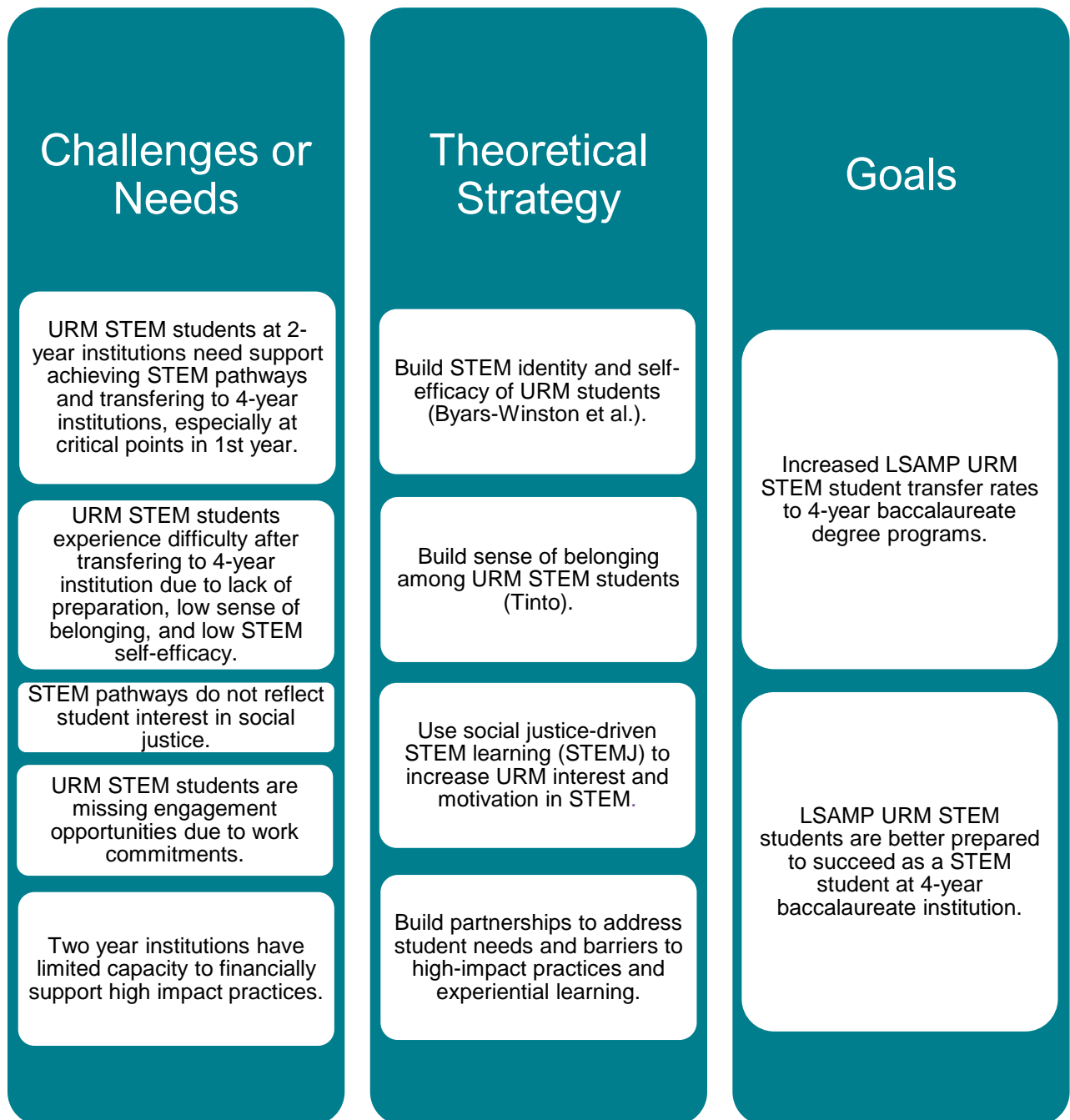
The challenges or needs the program addresses focus on building STEM⁵ pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.⁶ Contributing to these larger challenges are a lack of preparation, low sense of belonging, low STEM self-efficacy, 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).

⁴ Lisa Wyatt Knowlton and Cynthia C. Phillips (2012), *The Logic Model Guidebook*, London, Sage Press, Chapter 1.

⁵ “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>.

⁶ 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.⁷ The program logic model

⁷ Lisa Wyatt Knowlton and Cynthia C. Phillips, *The Logic Model Guidebook*, London, Sage Press, Chapter 1.

(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.

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 <i>Skill-focused</i>	# 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 <i>Persuasion/modeling focused</i>	# 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 URM	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 URM (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 <i>Persuasion and modeling focused</i>	# 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 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 fully understand the implementation context and triangulate data. The evaluation questions are as follows:

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?
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?

Process Monitoring Questions

1. What successes has the project achieved? Which component of the project 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?
5. How has this project affected the colleges overall?
6. What suggestions for program improvement are offered by students, staff, and faculty?

Outcome Evaluation Questions

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, retention, 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?

The evaluation framework can be found in Appendix A.

During the term of this grant project, 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 to accomplish their goals. Data sources that were available for the Year 1 report included qualitative data from site visits, baseline student survey data, and implementation data from institutions. A description of each of the available data sources follows.

Site Visit Data

A virtual site visit was held with each institution during February and March 2022. Site visit components included a student focus group, faculty/staff focus group, and a project staff interview. Table 1 demonstrates the site visit components that occurred at each location based on current state of implementation.

Table 1. Site Visit Components by Institution

	College of Central Florida	Pasco-Hernando	Polk State	Valencia
Project Staff Interview	X	X	X	X
Student Focus Group	X		X	X
Faculty/Staff Focus Group			X	X

The newest institution, Pasco-Hernando, did not have LSAMP members in Fall 2021. Therefore, there were no students to involve in a focus group and no faculty/staff members who had been working with students. Although the College of Central Florida has LSAMP members, the only faculty members who worked with the students at the time filled a project staff role; these faculty members were asked to participate in the project staff interview. In addition to the interviews and focus groups, meetings with the Institutional Research teams to discuss upcoming data collection at the end of the spring term were held with some institutions. The remainder of these meetings will occur in Spring 2022.

Baseline Student Survey

The Baseline Student Survey was administered to LSAMP students ($n=99$) at all institutions with students during February and March 2022. The survey was left open for a month to attempt to garner additional students' responses. In total, there were 29 responses: 4 students from the College of Central Florida (57% response rate), 12 students from Polk State (23% response rate), and 13 students from Valencia (33% response rate). The overall response rate across the alliance was 29%.

Implementation Data

Institutions were asked to submit implementation data from Fall 2021 in January 2022. Data sources included an advising log, engagement opportunity log, faculty log, student activity log, and detailed implementation report. These logs are available with the full evaluation plan in Appendix A.



Chapter Two: Overall Findings

Findings

The study findings are organized by the research questions and divided into three categories: process monitoring, fidelity of implementation, and outcomes.

Process Evaluation: Fidelity

Process evaluation questions 1 and 2 (see page 13) are discussed in the following section of the report. Specifically, the section discusses activities implemented in the LSAMP program, including student focused activities, faculty/staff focused activities, and department/institution focused activities. Implementation data were reviewed and compared with the original project plan as outlined in the funding application. Question 3, which explores the relationship of fidelity of implementation to short-term outcomes, will be analyzed beginning in the Year 2 annual report. Findings include data from the first semester of implementation, Fall 2021.

Documentation for August 2021-February 2022 demonstrated that the alliance made progress with student focused activities, in particular recruitment of LSAMP members, providing dedicated STEM advising, and planning a variety of engagement opportunities. See Appendix B for the project's fidelity of implementation assessment.

Student Focused Fidelity

Student focused fidelity is comprised of 12 different areas, of which 7 are presented in this report. The other 5 areas were not implemented in Fall 2021 and will begin in Spring and Summer 2022 as planned.⁸ Institutions made progress engaging students in orientation, advising, and other LSAMP experiences. The following sections detail implementation across the alliance and variation among institutions.

Student Recruitment and Engagement

Across the alliance, 99 students were recruited as LSAMP members in Fall 2021.⁹ Pasco-Hernando, the newest member of the alliance, was not able to recruit LSAMP members as the focus was on hiring staff members and building institutional capacity to start the LSAMP program.

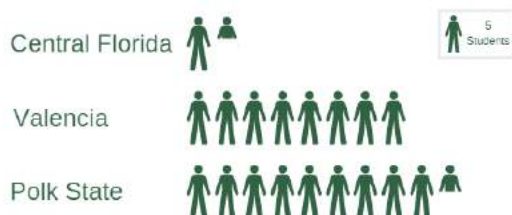
⁸ Student focused fidelity areas that were not evaluated at the time of this report include the summer bridge program, appropriate math course placement, and the STEM professionalization experiences (i.e., Research Scholars, Community Interns, Peer Coaches). STEM professionalization experiences will begin in Spring 2022 as students must be LSAMP members for one semester before applying. Data for the summer bridge and appropriate math course placement components will be collected at the end of Summer 2022.

⁹ There were 99 official LSAMP members in Fall 2021. However, some institutions provided data for students who were served by advisors or in the STEM Club and were not LSAMP members. In some instances, up to 150 students are reported.

Recruitment

Success with recruitment varied across institutions and was related to staff capacity and the length of time LSAMP had been established. As previously noted, Pasco-Hernando was not able to recruit LSAMP members in Fall 2021. Figure 3 demonstrates the number of LSAMP members by institution.

Figure 3. LSAMP Members by Institution, Fall 2021



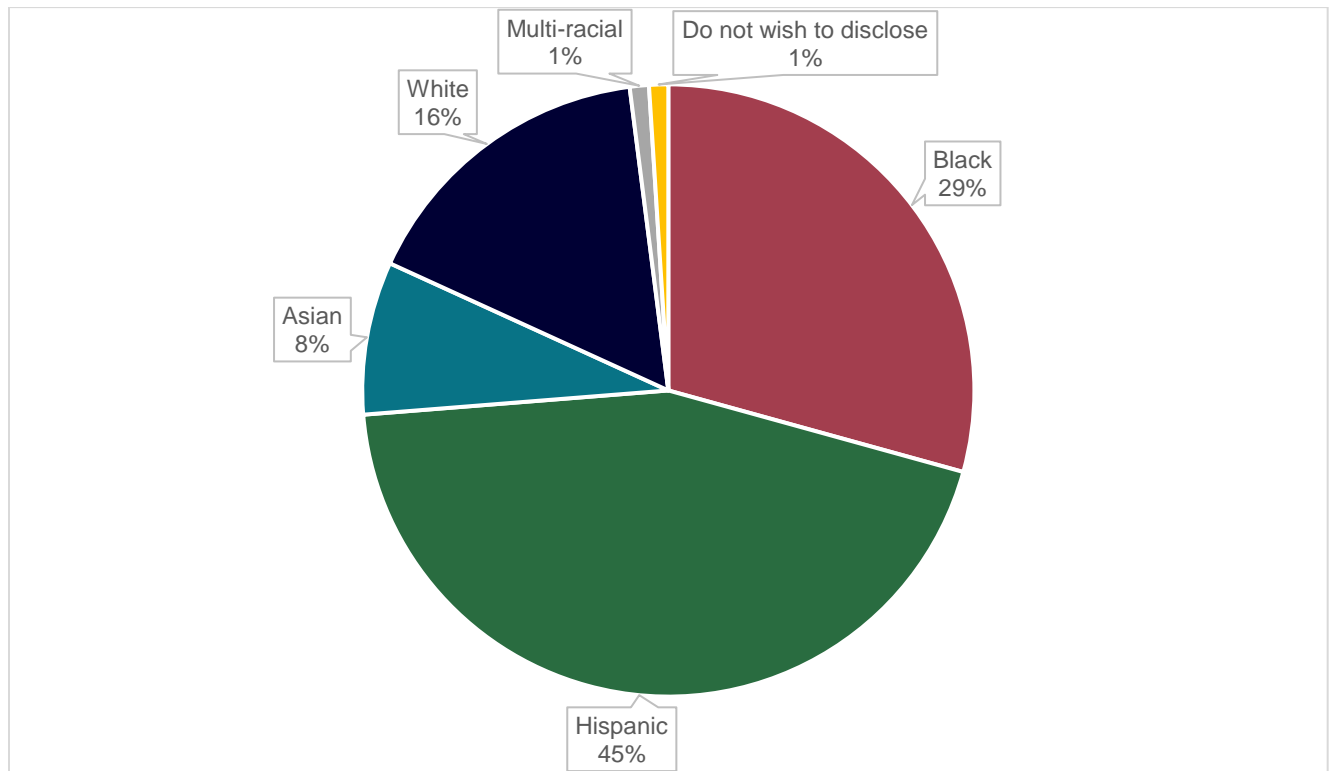
The College of Central Florida, a newer institution, recruited 7 LSAMP members in Fall 2021. Project staff hope to recruit more students but noted that by the time students participated in LSAMP they were done with their time at the College of Central Florida. Project staff explained this was one of the challenges of being a two-year college.

Polk State recruited 52 LSAMP members in Fall 2021. Project staff shared that they had to shut down recruitment for the first time. Staff explained, *“we do have a lot of students that want to be part of it [LSAMP]. But we’re looking at budgets and then financing purposes. So we have to shut it down.”* They elaborated that part of the challenge was that with 53 students, the advisor was at capacity. At Polk State, the advisor serves as the academic advisor and the STEM Club advisor, so his time is limited.

In contrast, Valencia explained they are still working on recruiting the numbers of students they would expect. In Fall 2021, the institution recruited 40 students across their three campuses. As they have an advisor and a STEM Club at each campus, they can serve more students than are currently enrolled as LSAMP members.

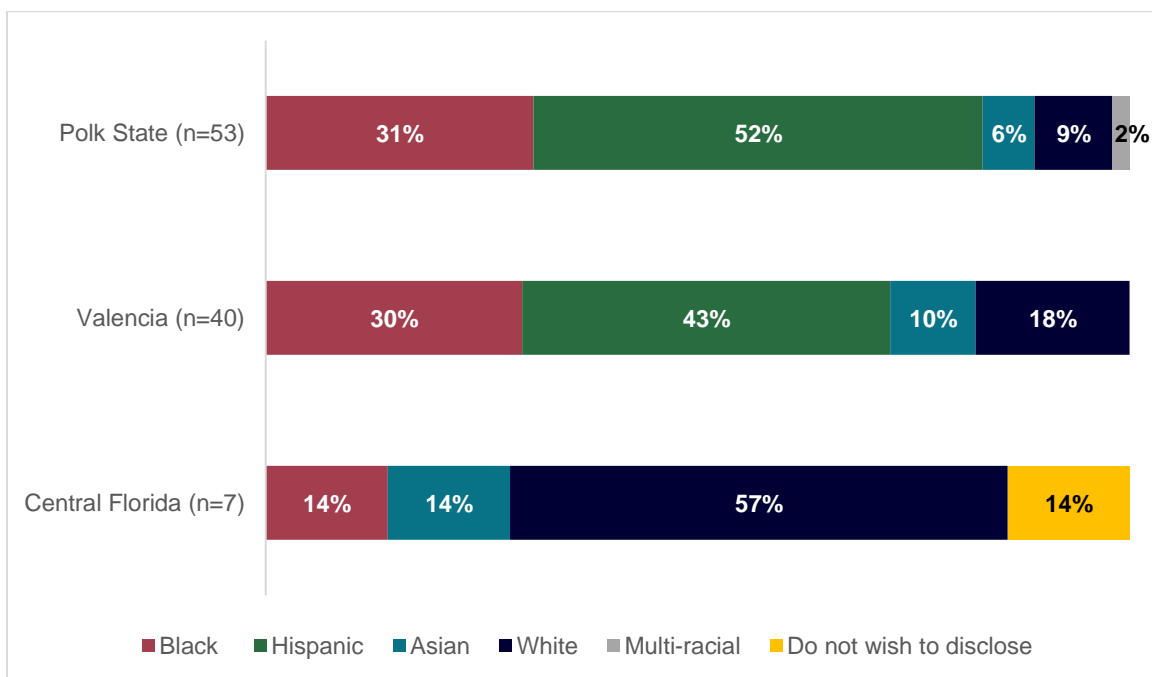
Of the 99 students recruited, 74% belonged to racially and ethnically minoritized groups. The alliance’s goal is for 90% of LSAMP members to be from these groups. The majority of students identified as Hispanic ($n=44$) or Black ($n=29$). No students identified themselves as Native American or Native Pacific Islander/Native Hawaiian. Figure 4 provides the demographic breakdown of the alliance.

Figure 4. LSAMP Member Demographics, Fall 2021 (n=99)



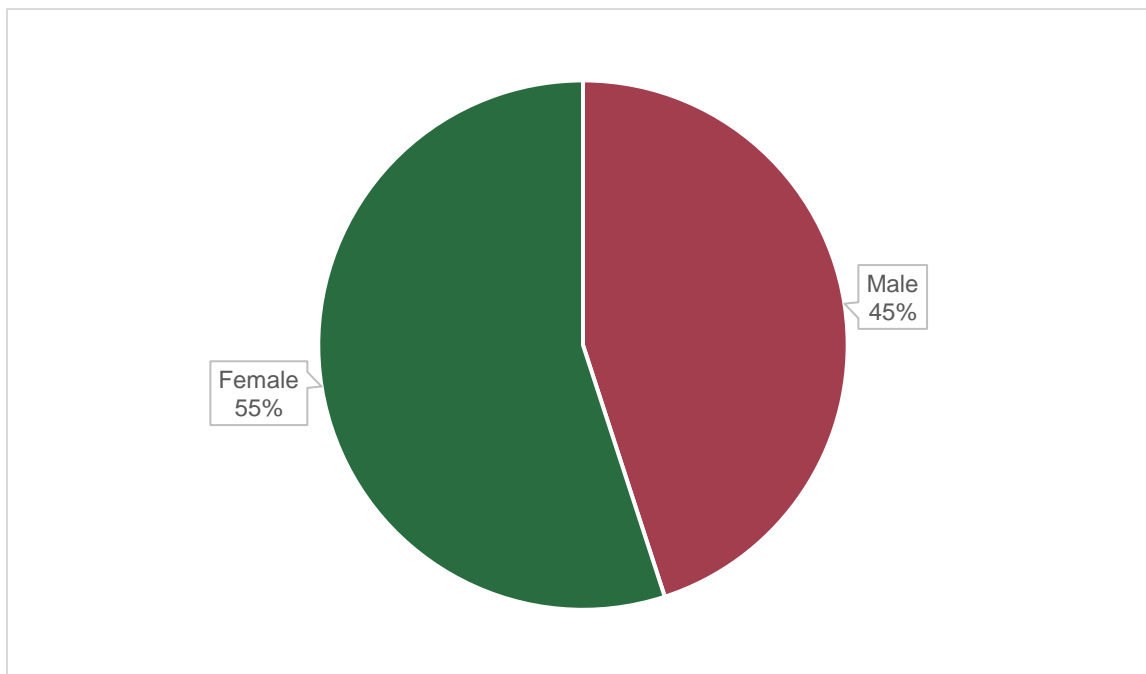
The percentage of students who belonged to racially and ethnically minoritized groups varied by institution from 14% to 83%. Figure 5 includes a full demographic breakdown.

Figure 5. LSAMP Member Demographics by Institution, Fall 2021



The majority of LSAMP members were female ($n=26$).¹⁰ See figure 6 for a full breakdown.

Figure 6. Gender of LSAMP Members, Fall 2021 ($n=47$)



At all institutions, project staff noted recruitment was a challenge in Fall 2021. The COVID-19 pandemic was a primary contributor to recruitment challenges. During this time, most institutions were still heavily virtual, with the majority of classes taking place in a hybrid or virtual format. Project staff explained that it has been more difficult to recruit students when they are not on campus and that they have not been responding to virtual invitations to join. One project staff member shared, *“You know if you’re not making that initial connection then it’s hard to engage them in deeper conversations about what they might gain through LSAMP.”* Project staff believe that personal situations related to the pandemic for their students have compounded this challenge, noting it is hard to get them to participate in LSAMP or *“other things that are not essentials for them to survive.”*

Students and faculty/staff members at institutions also discussed the challenge of recruitment. Students shared they would like to have more students involved in LSAMP and the STEM Club because they perceive the benefits of engaging with others with similar interests. However, marketing the opportunity is a challenge. Students reported that “word of mouth” recruiting by club members and advisors have been the most effective means; however, that depends on “who you know” and does not cast as wide a recruitment net. Faculty shared this concern, explaining that many students have never heard of LSAMP, so advertising to students is necessary as well as building an understanding among faculty members who can recommend their students to the program. As one student said, *“I suggest advertising a little bit more*

¹⁰ Gender information was available for 47 of the 99 students. One institution did not provide this information.

because I feel like the program is a really good program and it is a very great resource for any minority [student].”

Engagement

To remain an LSAMP member, students are required to meet with their advisor at least once per semester and participate in at least 3 LSAMP activities or programs per semester. In their first semester, students are also expected to complete LSAMP orientation. In the first semester, the percent of students completing each of these necessary requirements varied (see Figure 7).

Figure 7. Percent of Students Completing LSAMP Requirements, Fall 2021

72% completed orientation.
95% met with their advisor.
35% participated in 3 or more activities.

Orientation

LSAMP members are required to participate in LSAMP orientation once they have been accepted as LSAMP members. Institutions offer their own individual orientation sessions and fulfill this requirement in diverse ways. Seventy-two percent of students ($n=86$) completed orientation. There are several reasons why the remaining students may not have completed orientation. In some cases, these students were LSAMP members in the previous grant and did not need orientation during Fall 2021. One institution explained that they were still determining when to close the recruitment window—the window stayed open past the in-person and synchronous, virtual orientation opportunities, which meant LSAMP members may have only had an asynchronous virtual orientation that may not have been completed. Success with LSAMP members completing orientation varied among institutions.

As previously noted, the College of Central Florida currently has the smallest enrollment. Students were offered LSAMP orientation on a rolling basis as they became LSAMP members. Due to this, 100% of LSAMP Members ($n=7$) completed orientation.

Polk State and Valencia had more variation in the percentage of students who completed orientation. Polk State offered two different orientation sessions to students. From these two sessions, 53% of students ($n=32$) completed orientation. Valencia offered orientation in three ways, an in-person orientation, two virtual, synchronous orientation sessions, and a virtual, asynchronous session. From these opportunities, 89% of students ($n=47$) completed orientation.

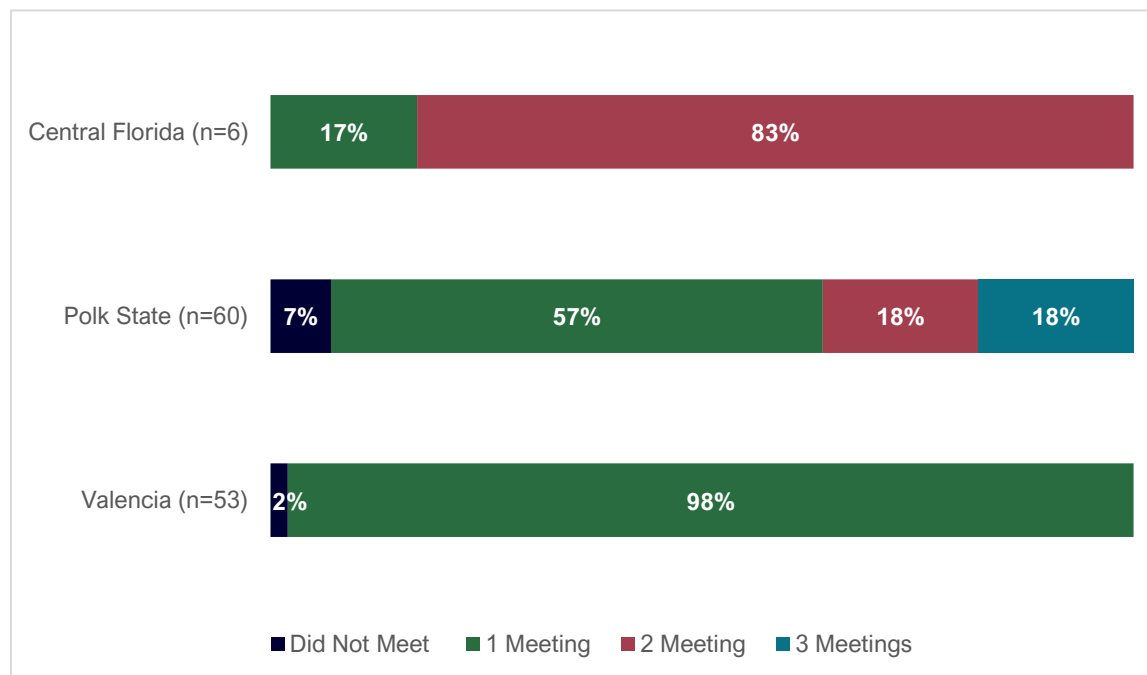
Advising

The alliance successfully implemented advising with students. LSAMP members are required to meet with their advisor at least once per semester. Advisors were asked to keep advising logs

and based on this information, 95% of students ($n=110$) met with their advisor at least one time.¹¹

There was not significant variation in the percent of students who met with their advisor at least once in Fall 2021. In fact, all institutions successfully met with over 90% of their students, with an alliance rate of 95%. However, variation was present in the frequency of advising meetings. Students at Polk State met with their advisor more frequently, with 18% of students ($n=11$) meeting with their advisor two times and 18% of students ($n=11$) meeting with their advisor three times. Further, the majority of College of Central Florida students met with their advisor two times ($n=5$). See figure 8 for a breakdown of how frequently students met with their advisors.

Figure 8. Number of Advising Meetings by Institution, Fall 2021



It is important to note this data should be interpreted with caution. It is unclear whether advising logs were maintained to the same extent at all institutions and if all advising meetings were tracked. Students were clear the advisor is a trusted resource at each institution. One key factor was the level of accessibility to their advisors. Students at two institutions shared similar perspectives about accessibility to their LSAMP advisors. One student explained the difference in working with her LSAMP advisor and her institution advisor and how her advisor had helped her, she explained: *“being able to speak to advisors that I’ve already known and know more personal things about me than my normal advisor...and the things that interested me, so they could help me go in a specific direction.”* Another student shared, *“They always want to make sure that we’re on top of our game and making sure that we actually have a plan on what*

¹¹ Advising log data was missing from 33 students at Valencia’s Osceola Campus and 1 student at Central Florida. These students were not included in the analysis.

classes we need to take and what credits are actually useful for towards our degrees.” Students appreciate that the advisors see what is possible for them and support them.

Engagement in LSAMP Opportunities

The majority of LSAMP members did not meet the requirement of participating in 3 or more LSAMP activities. Institutions held a variety of events, but the majority of students only participated in one event during Fall 2021 (44%). Due to staffing challenges, institutions did not begin holding events until mid to late October. With Winter Break beginning in early December for most institutions and Thanksgiving Break closing institutions for a week in November, this meant there was less than two months for students to participate in activities.

Engagement varied by institution. As a newer institution, the College of Central Florida had the smallest number of LSAMP members ($n=7$) and the smallest number of events ($n=6$) but was able to engage 100% of their LSAMP members held at Valencia and 22 at Polk in Fall 2021. However, engagement at these institutions varied with 51% of students ($n=30$) at Polk and 18% of students ($n=15$) at Valencia participating in 3 or more activities. As previously noted, this is likely due to the brief period of time in which events were offered in Fall 2021. This indicator will continue to be monitored in future semesters.

Although engagement in activities was low across the alliance, students responded positively when asked about their experience with LSAMP activities. When discussing the STEM Club, one student explained it had been, *“quite an amazing experience. I’ve never been in a program that is so active.”* Further, student awareness of growth that coincided with their LSAMP involvement was evident in the focus group discussions. One student shared that event planning was an unexpected skill set addition, while others highlighted leadership development through service as a club officer. Sometimes the student growth was internal such as learning, *“slow progress is still progress.”* One student’s comment was illustrative of the experience for many LSAMP participants:

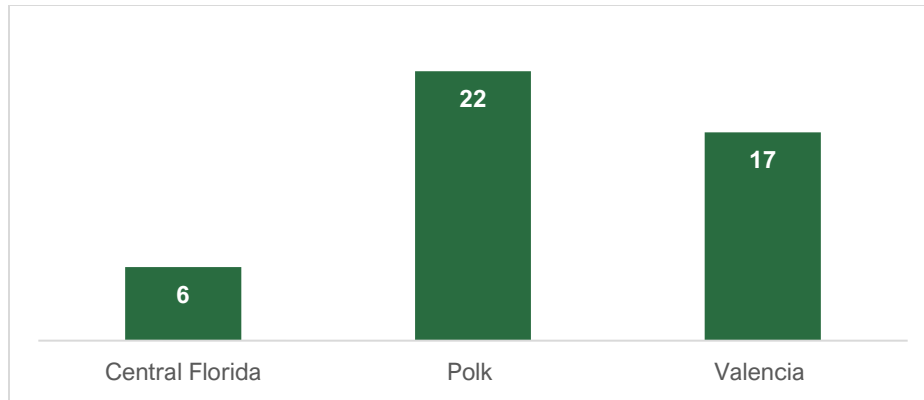
I’ve gotten experience in fields that I normally wouldn’t have searched for or looked into; I was able to strengthen areas within myself because of those opportunities... to get some experience with public speaking and also researching things that can help us in the work field. So that’s why I feel like going to a two-year college is very helpful. And also, LSAMP is very helpful because in doing that internship that helped me to get a sense and the feel of whether or not I liked it [the career].

Faculty agreed that they observed student growth through LSAMP program involvement. They shared experiences of how students who were initially unsure about themselves and their place in STEM found their voice through participation.

Engagement Opportunities

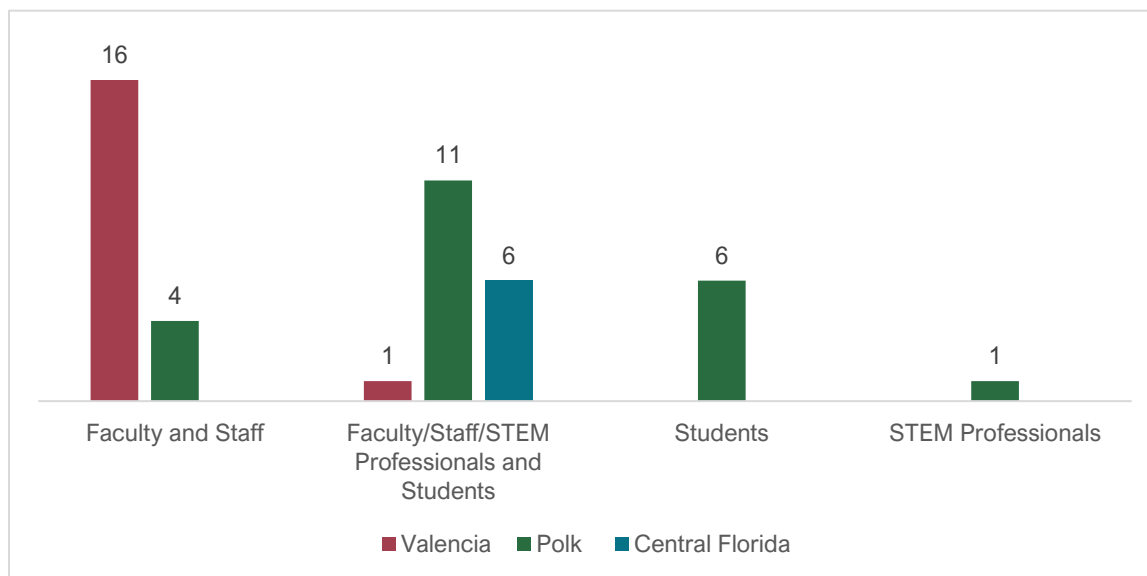
As discussed in the previous section, institutions must provide a variety of engagement opportunities for students. These opportunities include STEM skill-building workshops, informal support sessions, workshops on STEM careers and identity, networking opportunities, conferences, college tours, and industry tours. In Fall 2021, 45 different opportunities were offered across the alliance. Figure 9 shows the breakdown of opportunities by institution.

Figure 9. Number of Engagement Opportunities by Institution



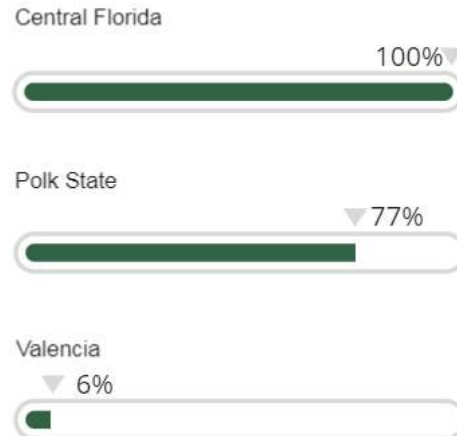
The majority of opportunities across the alliance in Fall 2021 were coordinated by staff members (44%) or by a combination of faculty/staff or STEM professionals and students (40%; see figure 10).

Figure 10. Event Leader Role, by Institution



Several fidelity indicators (i.e., 5.1, 5.2, 5.3, 6.2; see Appendix B) require students to lead activities. Figure 11 shows the percentage of activities led by students or a combination of students, faculty, staff, and STEM professionals. During this time, Polk State was the only institution to have students lead activities independently ($n=6$). This number is expected to increase beginning in spring 2022 as Peer Coaches are selected and begin at alliance institutions.

Figure 11. Activities led by Students, by Institution

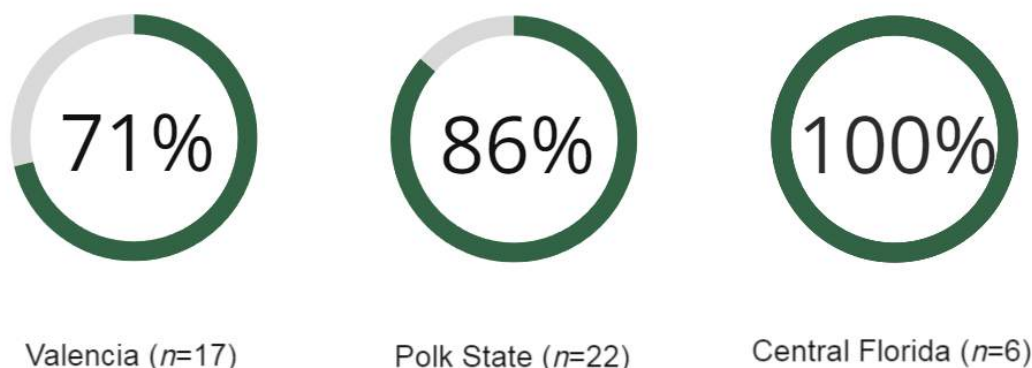


Due to the limited amount of time for opportunities to occur (i.e., October to December), institutions needed to focus on having enough opportunities for students to meet the engagement requirement (i.e., 3 experiences per semester) as opposed to ensuring student-led activities or that activities covered all areas (e.g., lab tours, college tours, STEM identity workshops). During a project staff interview, one staff member explained that it was challenging to get students to lead activities. However, they continued to work on implementation of the peer coach opportunity beginning in Spring 2022, which will increase the number of student-led activities. Another challenge was that institutions did not allow travel during most of Fall 2021 because of the pandemic. This limited opportunities for college/lab tours and in-person conference opportunities.

Based on engagement opportunity logs, the majority of activities offered in Fall 2021 were workshops. However, Valencia was able to plan a college tour at the University of Florida in late Fall 2021 and sent four students to the virtual Annual Biomedical Research Conference for Minority Students. Project staff explained that they typically partner together on opportunities like college/lab tours and conferences and plan to do more of this as travel restrictions ease at the institutions. More information about the type of activities offered can be found in tables 5-9 in Appendix B.

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. This was also important in Fall 2021 as some students were still engaged in distance learning. Eighty-two percent of opportunities ($n=37$) were offered virtually across the alliance. Figure 12 shows the percentage of opportunities offered virtually by institution.

Figure 12. Percentage of Engagement Opportunities Offered Virtually, by Institution



Overall, the alliance had a successful first term with student focused activities. Institutions made progress transitioning from the prior grant to the current grant and recruiting students. Across the alliance, advising was a success with almost all LSAMP members (98%) meeting with their advisor at least once and focus group participants speaking positively of advising. Engaging LSAMP members in activities proved to be more challenging, with 35% of students meeting the requirement of participating in at least three activities. However, the late start to implementation due to staffing challenges resulted in a smaller number of experiences being offered. Although Pasco-Hernando did not begin implementation with students in Fall 2021, internal planning to ensure a successful spring term was conducted. A full breakdown of student focused fidelity indicators can be found in Appendix B.

Faculty Focused Fidelity

The alliance made progress with faculty and staff involvement in Fall 2021. Faculty engaged in student activities, with 108 (potentially duplicated) faculty members participating across the alliance. As previously noted, staffing challenges led to a later start and students being recruited in October. Further, an interim project director was in place during Fall 2021. Project staff explained the focus had to be on student-focused activities.

Two faculty focused activities that did not occur as intended in Fall 2021 were faculty development and participation in CFSA workgroups and implementation teams. The alliance was not able to offer workshops for faculty and staff members. These workshops are expected to begin in Year 2 after the new project director is established.

CFSA Work Groups were introduced at the July 2021 Alliance Kick-Off meeting and institutions selected individuals to serve on each work group. However, most work groups were not convened in Fall 2021 and were scheduled to begin meeting in March 2022.

The evaluation work group was established in early Fall 2021 and supported the evaluator virtually. The work group provided 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. This work group will begin meeting regularly in March 2022.

In addition to CFSA Work Groups, faculty and staff members are expected to be involved in institution-specific implementation teams. These teams were discussed with project staff during the virtual site visit. While teams of faculty and staff are meeting at institutions, the process is not yet formalized.

The participation of faculty and staff members in student activities and alliance's plan to convene work groups beginning in March 2022 is promising. Once an official project director is in place, we anticipate more progress in faculty focused activities. A full breakdown of faculty focused fidelity indicators can be found in Appendix B.

Department/Institution Focused Fidelity

Progress was not made on department/institution focused fidelity measures in Fall 2021. These activities included developing articulation agreements, STEM degree pathways, or data sharing agreements with university partners and establishing the Assessment and Evaluation Group. The Interim Project Director explained that with the other challenges that have been faced, these tasks could not be a priority yet. However, a draft data sharing agreement was previously developed and will be refined as a template for the alliance in Year 2 once a project director is hired. A full breakdown of department and institution focused fidelity indicators can be found in Appendix B.

Process Evaluation: Process Monitoring

Process monitoring questions are discussed in the following section of the report. Specifically, the section discusses program successes, challenges, and internal and external factors that have affected program implementation, sustainable actions, how the project has affected the colleges, and recommendations from stakeholders (i.e., faculty, staff, students). Interview and focus group data were reviewed for common themes. This section summarizes information shared in the fidelity section to answer the process monitoring questions. Findings include data from the first semester of implementation, Fall 2021.

Focus group and interview findings from discussions of the Fall 2021 term demonstrated that institutions had experienced success with recruitment, dedicated STEM advising, and providing engagement opportunities. Challenges included lack of progress on department/institution and faculty-focused activities, recruitment of racially and ethnically marginalized minoritized groups, and engagement of recruited students. The pandemic was a primary external factor that caused challenges for implementation, specifically because of the necessity of virtual events, travel bans, student lack of technology and internet access, and Zoom fatigue. Internal factors that caused challenges were related to staffing. Colleges were positively affected due to the influx of funding which led to better opportunities for students and increased cross-institution collaboration.

Successes

Although the alliance did not make as much progress as staff anticipated during the first semester of implementation, there were many successes. Successes were seen with recruitment, dedicated STEM advising, and providing engagement opportunities.

Recruitment was a success during Fall 2021 and the alliance was able to recruit 99 LSAMP members across three institutions. In some cases, institutions were able to rely on STEM Clubs from the prior grant as a recruitment pool. However, some institutions had to start from scratch with recruitment. Gains were made at all institutions with LSAMP members.

While the alliance made progress with recruitment, the biggest success of Fall 2021 was related to dedicated STEM advising. Ninety-five percent of students ($n=110$) across the alliance met with their advisor at least once during Fall 2021. This is particularly impressive considering two of the three institutions with LSAMP members had difficulty filling all academic advisor roles in Fall 2021. In addition, the Polk advisor, who was in place the full semester, met with 36% of his students ($n=22$) two or more times during the semester. Students spoke positively about their advisors at all institutions, reporting how they support they receive is different than that of their regular advisors. Students explained they felt the advisors cared about them and were willing to support them in any way necessary.

Despite challenges related to staffing and the pandemic, the alliance did well with planning a variety of engagement opportunities at each institution. Forty-five student events were planned across the alliance during Fall 2021. Of these events, 82% were virtual, which helped to ensure events were accessible to all students as many students were still taking classes virtually. Further, some of the student focused engagement indicators (i.e., 5.1, 5.2, 5.3, 6.2; see Appendix B) require students to lead engagement opportunities. The alliance demonstrated initial success with this, with 53% of activities ($n=24$) being led by students or a combination of students and others (i.e., staff, faculty, STEM professionals). The activities held at institutions varied from workshops and guest speakers to college tours and STEM industry lab tours. Further, all three institutions with LSAMP members had active STEM Clubs in Fall 2021.

Challenges

In Fall 2021, challenges were experienced with department/institution-focused fidelity, faculty/staff focused fidelity, and data collection for the evaluation. However, student-focused challenges were present with recruitment of racially and ethnically minoritized groups and engagement of recruited students.

The project was designed to have three different types of activities: student-focused, faculty-focused, and department/institution focused. Challenges were experienced with department/institution focused activities and faculty/staff focused activities. As previously noted, activities in these areas did not formally occur during Fall 2021. Project staff explained that there was no way to focus on these activities given staffing challenges (see *Internal and External Factors*, pp. 29-32) and the need to focus on student-focused activities.

Of the student focused activities, the main challenges were around recruitment of students from racially and ethnically minoritized groups and engagement. Project staff noted that when the

grant proposal was written, it was expected that things would be back to normal from the pandemic in Fall 2021. Based on the prior grant, they believed it would be possible to ensure 90% of LSAMP members were from NSF-defined under-represented minority groups (i.e., Black, Hispanic, Native American, Native Hawaiian/Native Pacific Islander). However, the pandemic continued to be a challenge and institutions were not able to meet this goal. It is unclear the exact reason why this was the case, but project staff suspect it is related to general challenges with recruitment which are described in more detail in the following section.

Further, engagement of recruited students was a challenge with only 35% of students across the alliance meeting the requirement of engaging in three or more activities during Fall 2021. This challenge was related to the short period of time activities were able to occur (i.e., October through early December 2022).

Finally, data collection for the evaluation was a challenge. Data collection tools for the evaluation were presented to project staff in early Fall 2021. However, with competing data collection requirements (e.g., WebAMP), compiling the data for the evaluation was challenging. Further, several institutions submitted several data logs with data for more than just LSAMP members.

Internal and External Factors

There were two main factors that affected implementation in the first year of the project, staffing challenges and the pandemic.

External Factors

The ongoing pandemic, an external factor, caused several challenges in Fall 2021. These included requiring a majority of events to be virtual, travel bans causing limited opportunities for college visits, lab tours, and conferences, challenges related to technology needs and internet, Zoom fatigue, and engaging faculty.

There was a high level of agreement across the stakeholder focus groups that COVID-related concerns impacted programming. The students noted they would like more in-person events. However, they understand that due to pandemic concerns face-to-face meetings and field trips are not always possible and at times must be cancelled due to increasing COVID case counts. As one student reflected, *“I feel like right now there is not too much going on.... something here and there, but not as it used to be before [the pandemic].”* The students are aware from personal experience or hearing about past STEM Club events and field trips that their experience is unique. Across all three schools, students want more in-person interaction.

Project staff agreed with students and discussed challenges related to institution travel bans due to the pandemic and accommodating students who were learning from a distance. The majority of events have been virtual to date (see Figure 12, p. 26) and events are still being planned virtually such as STEM Summit and the Summer STEM institute. Staff explained that virtual engagement is a challenge:

It's not as easy for them to get involved and engaged when as before, when they were on campus. So as the dedicated advisor for [campus], I have had to really work a little bit

harder to get the students to really see the vision and then importance even though you're online at home.

Staff further elaborated students had:

Became kind of complacent being at home and then going to work, so it makes them a little bit more, not as motivated as when they're on campus and they see all the camaraderie going on at the table. And so I have had to really reach out to them. Email them posing meetings so to get them involved to let them know that hey, this is still LSAMP. Everything is still the same but instead of being in person 90% of the time we're online.

Related to the pandemic, technology needs, and internet access were reported as challenges to engaging students. Several institutions discussed how the communities they served had differing needs and access to technology and the internet. Particularly for their students in more rural areas, internet access was difficult. As most of the opportunities for engagement were virtual, a lack of internet access and technology impeded participation.

Finally, project staff believe Zoom fatigue¹² has served as an additional barrier to engagement. Because of the pandemic, many students were attending classes virtually, meeting with advisors virtually, and participating in activities virtually. While they may have wanted to participate in LSAMP, it may not have been as appealing when it involved logging onto another Zoom meeting.

The pandemic was not only a challenge for recruiting and engaging students, but for faculty too. Faculty explained pandemic-related stress and exhaustion have reduced faculty's willingness to mentor students and engage in other activities. One institution also shared that service requirements for faculty members have changed along with the other roles they are asked to do. This makes it more difficult for them to serve as faculty mentors.

Internal Factors

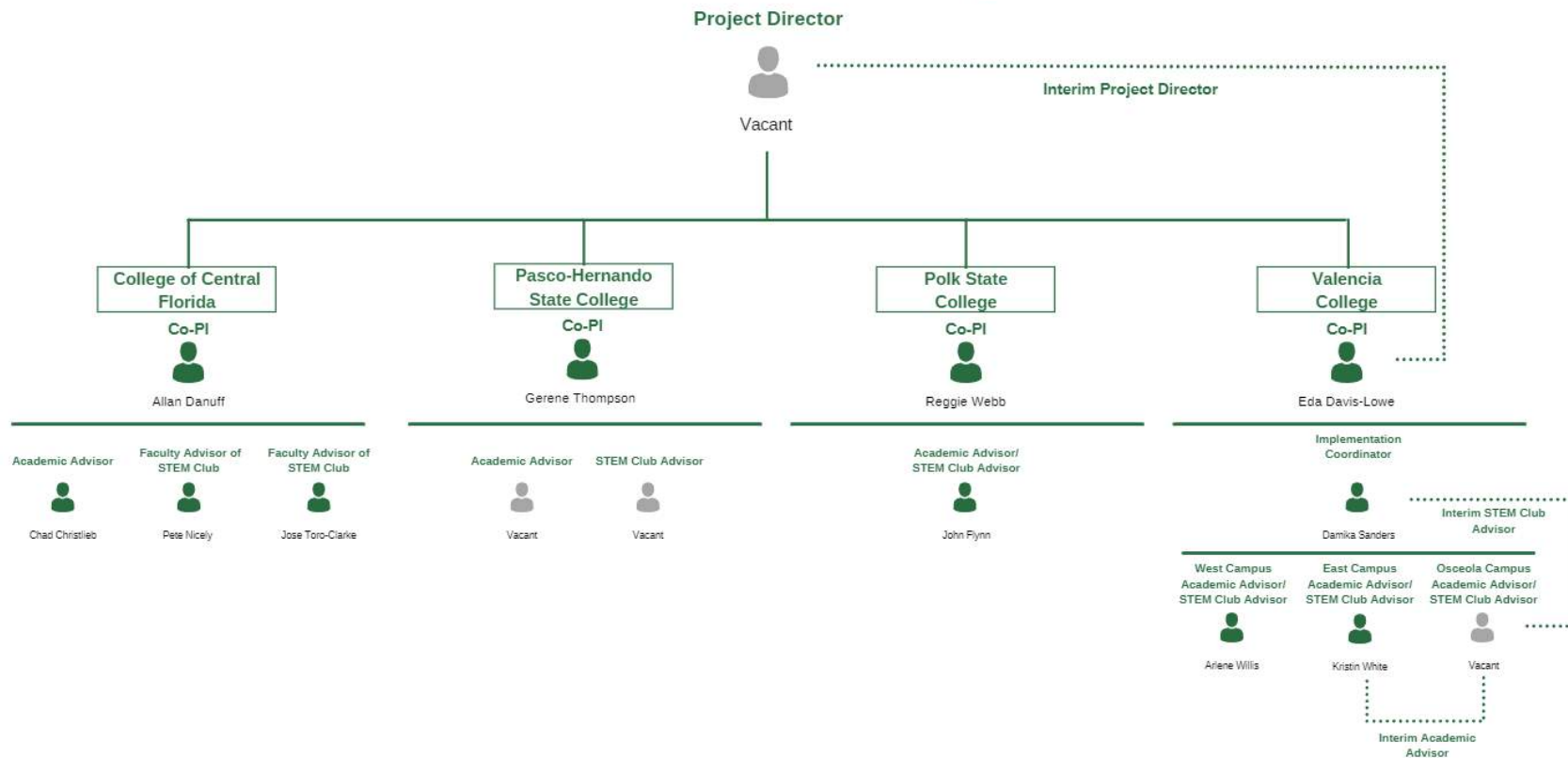
Staffing was an internal challenge throughout Fall 2021 for three of the four institutions. As previously noted, the Valencia Co-principal Investigator served as the Interim Project Director throughout Fall 2021. There was a search at the beginning of Fall 2021 that was successful. However, the staff member hired for the position was from Valencia and then left the college for after one month in the position. Another search was conducted in January 2022 but was not successful.

Valencia began this year with one of three advisor positions filled. A search was held, and the college was able to hire the advisor for their East Campus. The East Campus Advisor Fall 2021. Figure 13 provides an overview of staffing at the end of Fall 2021.

¹² <https://news.stanford.edu/2021/02/23/four-causes-zoom-fatigue-solutions/>

Figure 13. Organizational Chart, December 2021

Central Florida STEM Alliance Organizational Chart



In March 2022, staff needs had been mainly filled. Reorganization had occurred at Valencia to allow Damika Sanders, the Implementation Coordinator at Valencia to also step in as the Interim Project Director. In this position, she will partner with Eda Davis-Lowe, Valencia Co-Principal Investigator and Central Florida STEM Alliance Director, to ensure comprehensive support and facilitation of alliance functioning and programming.¹³ Further, Pasco-Hernando had been able to hire their academic advisor.

How has this project affected the colleges overall?

The project affected colleges through capacity building, an increase in cross-institution collaboration, and an influx of funding which led to more resources for students.

The new LSAMP grant has helped institutions to build capacity and increased cross-institution collaboration at higher levels. Institutions built capacity individually, by collaborating with different departments and developing new procedures. In addition, the first Governing Board Meeting was held in January 2022 and included the presidents of all four institutions. During this meeting, presidents were provided with an update on LSAMP's progress in Fall 2021 and shared their hopes for the future of the alliance. The presidents were supportive of the goals of the project and had ideas to increase visibility and improve at the college level. As these meetings continue twice yearly, the presidents will engage in conversations around sustainability, leveraging the work of LSAMP at the colleges, and ensuring programs have all support needed (e.g., staffing) to ensure success.

Further, the influx of funding supported additional resources for students through staffing. Institutions hired staff members (e.g., advisors) who directly provide services to students through dedicated STEM advising, STEM clubs, and LSAMP engagement opportunities.

From the student focus groups, it was clear that these opportunities positively affected students. Students positively spoke of their participation in STEM Clubs and the opportunities they were provided through participation in LSAMP. Further, it was clear the dedicated STEM advising was very valuable. Students described how the LSAMP advisors were able to meet their needs in ways their other advisors couldn't and how they knew them better. It was clear many of these advisors had an open-door policy, contributing to relationship building with students.

Sustainability

Several sustainable actions and efforts emerged in the first semester of implementation:

- **Establishing meetings:** Significant progress was made establishing meetings and procedures, both alliance-wide and by institution. The alliance began to hold two regular meetings. Monthly Conversations are attended by the co-principal investigator at each institution, the Project Director, Valencia's Director of Grant Compliance, and the external evaluator. Quarterly Alliance Meetings are held once a quarter and include all of the previously named parties from the Monthly Conversation and any other project staff from the participating institutions. Beginning in June 2022, the alliance plans to invite

¹³ While the roles are filled temporarily at this time, the alliance structure is changing. A new search will begin in Spring 2022 for the Project Coordinator whose position will replace the current project director position.

representatives from partner institutions to attend the Quarterly Alliance Meetings as well.

Although formalized meetings did not occur in the first semester of implementation, the CFSA working groups have been established and began meeting in March 2022. The Evaluation Work Group communicated via email to complete several tasks in November and December 2021.

Finally, institutions have been meeting internally to plan for and discuss implementation. Project staff reported these meetings provided opportunities to plan for upcoming opportunities, develop procedures, and troubleshoot challenges.

- **Convening the Governing Board:** As previously noted, the Governing Board held their first meeting in January 2022 and plans to meet twice annually moving forward. During the meeting, the college presidents spoke of goals to increase performance at individual institutions and ensure sustainability. The commitment of the presidents to continue meeting and planning is a sustainable action.
- **Learning from challenges:** Project staff at each institution have needed to pivot to overcome challenges during the first semester. Valencia had a recruitment cutoff date that was after the final synchronous orientation session, which resulted in students becoming LSAMP members but not completing orientation. The College of Central Florida had a failed advisor search, but was able to utilize the STEM major advisor at the college to serve LSAMP students. As institutions learn how to successfully navigate these challenges, capacity is built to improve in the future.

Recommendations from Stakeholders

Students and faculty members were asked for recommendations to the LSAMP program during the focus groups. In general, student recommendations focused on increasing LSAMP membership and addressing programming opportunities. Faculty recommendations were related to involving faculty members in LSAMP.

Students from two colleges wanted to increase involvement in the club as one said, *“I feel like we could help out many more students...just get ourselves out there.”* Students from all three colleges had ideas about programming; students from two schools wanted opportunities to network and learn more about specific careers in which they were interested, another student expressed a desire to have less virtual programming, and finally a student recommended skill building workshops (e.g., entrepreneurship, team building).

Faculty recommendations focused on additional ways to involve faculty in LSAMP. As part of the LSAMP orientation, one college’s focus group participant thought that it would be helpful to include college administrators and faculty in the LSAMP orientation. At another school, a club programming recommendation was to have faculty share their STEM journeys. Finally, both schools who were challenged by student recruitment generated ideas of how to address it including: making it easier for faculty to recommend a student for LSAMP (i.e., online form) and doing targeted outreach to former LSAMP students who are still enrolled but are not currently active. The recommendations leverage relationships to provide avenues for involvement.

Outcome Evaluation

Outcome evaluation data related to the strategic indicators were not able to be collected at the end of Fall 2021, due to the nature of the indicators. For example, retention and persistence data (Strategic Indicator 3) is collected each fall. The full list of strategic indicators is presented in the evaluation plan in Appendix A. Indicators will be presented for the first time in the Year 2 report.

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 full list of supplemental indicators is presented in the evaluation plan in Appendix A. Indicators will be presented for the first time in the Year 2 report.



Chapter Three: Institution Findings

College of Central Florida

Current Status

The College of Central Florida is comprised of five campuses. The College of Central Florida was the third institution to join the alliance and began working with LSAMP right before the pandemic. As such, progress is limited in comparison to Valencia and Polk State; the College of Central Florida has yet to conduct alliance initiatives such as the Summer STEM institute. As part of the LSAMP program, the College of Central Florida has two faculty STEM advisors who lead the STEM Club. For the majority of the Fall 2021, the College of Central Florida worked to hire the dedicated STEM advisor, but ultimately the position was assigned internally to the current STEM advisor.

At the end of the Fall 2021 semester, the College of Central Florida had recruited 7 LSAMP members. Of the seven LSAMP members recruited, 14% belonged to racially and ethnically minoritized groups. Although the College of Central Florida had the smallest number of LSAMP members, they were able to successfully engage these students. All students completed orientation, participated in three or more STEM activities, and met with their advisor at least once during Fall 2021. The College of Central Florida provided six virtual engagement opportunities to their students in Fall 2021. In addition to STEM Club meetings, the college hosted workshops on containerization, Kubernetes¹⁴, and research experiences (e.g., UCF Summer Physics Exchange Program).

Institution Successes

The College of Central Florida experienced several successes in Fall 2021, which included student recruitment, student engagement, advising, and benefits from participation in the STEM Club.

Student recruitment was considered a success for the college. During the focus group, students were asked how they learned about LSAMP; the majority of students reported they learned about it by word of mouth (i.e., from other students or advisors) or from Club Rush which occurred at the beginning of the year. The students shared that they saw STEM Club as, “*a good opportunity to get involved.*” One student further explained that during recruitment she heard from another STEM Club member who shared that, “*she got an internship at NASA, so that made me realize that joining STEM Club can give a lot of opportunities.*” Word of mouth and Club Rush were important contributors to recruitment in Fall 2021.

Although the College of Central Florida had a small group of LSAMP members, they were able to successfully engage all their students in orientation and activities. Orientation was provided to students as they joined and enabled the advisors to successfully orient 100% of students. As previously noted, 100% of students also participated in at least three engagement opportunities. These opportunities were virtual and consisted of speakers and monthly club meetings. Students spoke positively about the experiences they participated in and discussed two

¹⁴ <https://kubernetes.io/>

speakers, one on human cognition and another about the hands-on science programs offered at the University of Florida.

Students shared the importance of the STEM Club advisors and the role they played in their experience. Students discussed the advisors during focus groups and reported they could talk to them and felt like they cared about their students. They also explained the advisor looked at *“research opportunities for us as ways to get involved.”* The role of the advisor was important for the students’ experience.

Student growth through STEM Club membership was evident and students attributed this growth to several things including building capacity to talk in front of people and serving in club leadership. One student shared that, *“it [club leadership] gave me an opportunity to work with the team in a way that I hadn’t before...building team skills.”* Another focus group participant discussed a different facet of leadership, *“I got a chance to look into event planning...it was interesting to see what it takes to try and get an event altogether, get some kind of speaker or some kind of trip organized and reflect with the team, reflect with other people in the club.”* However, it was not just leading the club that attributed to growth, but also participating in activities. One student explained, *“just having events where they have different speakers from different fields come and talk really opened my eyes to how many different paths there are in STEM.”*

Institution Challenges

The LSAMP program at the College of Central Florida experienced a few challenges during Fall 2021. Although the College of Central Florida successfully recruited seven LSAMP members, project staff and students reported recruitment as being a challenge. Further, staffing and the pandemic were reported as challenges.

Project staff noted that recruitment had been a challenge and that by the time they recruited students and got them involved, it felt like they were already leaving. They attributed this to a challenge of being a two-year institution. However, in further discussion part of the challenge may have been related to not having the Summer STEM Institute the year prior. If project staff were able to engage incoming high school seniors from the Summer STEM Institute, they would have these students involved for at least two years. Project staff explained that if you do not get to work with students at the beginning of their time at the institution, you only have them for a short time before they leave.

Staffing was also a challenge during Fall 2021, as project staff had difficulty hiring a STEM academic advisor. Although a search was conducted, it was not successful. The college decided to use the major STEM advisor as the LSAMP advisor too. Once this role was filled, the advisor was able to successfully meet with all LSAMP students. It is unclear why the search initially failed.

Finally, the pandemic was a challenge in Fall 2021, particularly with student engagement. All club activities were virtual and project staff explained that often times, they would see the core club members (i.e., STEM Club leadership), but have more difficulty engaging the wider club membership. Students also discussed the pandemic as a challenge to engagement, specifically noting a cancelled in-person field trip. As one student shared, *“I understand with how the world is going right now, maybe that [in-person] is not always possible, but anything in person I would*

have preferred.” The student continued, *“I’m especially looking forward to doing this field trip...actually getting to go somewhere and not just look at a screen.”* Another student shared that while in person is preferred, that the club decided to keep the meetings on Zoom because that worked better for club members as there is a desire to, *“grow involvement in the club.”* While virtual can help make things more accessible for students due to the pandemic, across alliance institutions project staff have noted that students seem less likely to participate because of Zoom fatigue.

Evidence of Sustainable Efforts

During Fall 2021, the College of Central Florida made progress in building funding stability. As previously discussed, staffing was a challenge at the beginning of Fall 2021. The College of Central Florida’s staff include a Co-principal investigator, two faculty STEM Club advisors, and a STEM academic advisor. Project staff explained they thought the challenges with hiring an advisor were related to the fact it was a part time position. Although it took some time to hire the STEM academic advisor, the college has now established a full team to focus on implementation at the college. The STEM academic advisor is situated in the college as the STEM major advisor and will remain in place regardless of funding.

Pasco-Hernando State College

Current Status

Pasco-Hernando State College is the newest institution to the alliance and began working with LSAMP in Fall 2021. Pasco-Hernando did not have LSAMP members in Fall 2021 and instead worked on filling open positions, planning for recruitment, and ensuring infrastructure was in place for a successful first semester of student implementation in Spring 2022.

Pasco-Hernando held a search in Fall 2021 to fill the advisor role but was not successful. An advisor was finally hired in March 2022 and is scheduled to begin her work in April 2022. Although the institution had an existing STEM Club, which is a component of how LSAMP students are served, the club had been “*decimated*” and had no existing LSAMP members in Fall 2021.

Project staff also worked on planning for the spring semester, which included discussing recruitment tactics (i.e., campus-based, using the Annual STEM Summit), determining how LSAMP fits with other programs at the college (e.g., the College Reach Out Program), and beginning to plan for summer engagement opportunities.

Institution Successes

Pasco-Hernando experienced several successes in Fall 2021. These included planning for recruitment, developing infrastructure at the college to support the LSAMP program, and preparing for implementation.

As Pasco-Hernando was new to the alliance, staff did not have pre-existing LSAMP members to recruit. Further, although there was a STEM Club at the college that was established prior to Fall 2021, there were no LSAMP members. Project staff believe this club failure was related to the pandemic. Pasco-Hernando knew they would need to be creative with recruiting. In addition to recruiting on campus in the ways other alliance institutions do (e.g., recruitment tables, orientation activities), project staff worked to produce other ways to recruit students. One suggestion that was approved by LSAMP project director was inviting potential LSAMP members to the STEM Summit and using the experience as a recruitment opportunity. Typically, the annual STEM Summit is only available to LSAMP members. However, because it will be virtual this year due to the pandemic, Pasco-Hernando will be able to use the event to recruit students. Pasco-Hernando asked the Associate Dean for Student Activities to help them identify students for this opportunity.

Pasco-Hernando also worked on building infrastructure in Fall 2021 by working to hire vacant positions and determine how LSAMP would work with other similar programs at the college. There was a failed search for the LSAMP advisor position, which the project staff attributed to the fact it was a part-time position. Project staff decided they needed to make this a full-time position and combined it with pre-collegiate programs to recruit for a pre-collegiate programs/LSAMP advisor. Project staff noted this was a good fit because in many cases, the same demographic of students was being served, just at separate times in their academic careers (i.e., middle school/high school students, college students). This also spawned conversations about how their pre-collegiate programs, specifically the College Reach Out

Program (CROP)¹⁵, could work with LSAMP. The CROP program serves low-income, educationally disadvantaged students in grades 6-12 and offers summer programming. Project staff hope they can leverage the CROP program and other pre-collegiate programs to support those students through LSAMP once they attend Pasco-Hernando.

Project staff used Fall 2021 as an opportunity to learn and prepare for reporting and implementation. Although Pasco-Hernando did not have students, the Co-principal Investigator was involved in all planning activities and meetings. She used the opportunity to ask questions and clarify her understanding. While the co-principal investigators from other institutions were finalizing the WebAMP report from the prior grant, she asked for copies of what was being submitted so the college could prepare for future submissions. The Co-principal Investigator explained that the opportunity to collaborate and get guidance from the larger alliance had been very beneficial. She noted that sitting in on planning and program meetings had been helpful because she gained a sense of expectations and deliverables. Further, it was also helpful to hear what had been done to meet deliverables and address challenges. This contributes to sustainability because the Co-principal Investigator has spent adequate time preparing for successful implementation.

Institution Challenges

The biggest challenge experienced for Pasco-Hernando was staffing. Pasco-Hernando was not able to hire an academic advisor in Fall 2021. Further, the college's Co-principal investigator worked closely with the Dean of Institutional Effectiveness as they planned for implementation of LSAMP, but the Dean ended up taking a job at another institution and was not replaced until early 2022. Because of a lack of staff members, Pasco-Hernando could not start implementing with students in Fall 2021. Instead, the focus had to be on filling staff positions and planning for Fall 2021 when sufficient staff would be in place to begin implementation.

Evidence of Sustainable Efforts

Several sustainable efforts emerged during Fall 2021. These included reorganizing the advising role to ensure it was a full-time position and leveraging pre-existing programs.

As previously discussed, the failed search resulted in project staff working with college leadership to determine how to make the position full-time. The position was eventually combined with a half-time pre-collegiate advisor position and advertised. This led to a successful search that concluded in March 2022. The position is more sustainable as pre-collegiate programs such as CROP have been part of Pasco-Hernando for a long time. Alliance members at other institutions have discussed challenges with staffing and not being able to fund staff members after the conclusion of the grant. Combining these roles helps to provide funding stability.

The project also made progress building organizational capacity through leveraging pre-existing programs at the college and determining how to utilize these to support LSAMP. Project staff explained they had the opportunity to partner with some long-standing programs (i.e., CROP, Center of Excellence¹⁶). These programs serve similar populations of students but engage them

¹⁵ <https://equity-services.phsc.edu/programs/pre-collegiate/college-reach-out-program>

¹⁶ <https://equity-services.phsc.edu/programs/pre-collegiate/center-excellence>

prior to twelfth grade. In addition to combining the advising role with these programs, project staff have also discussed how LSAMP can be advertised to CROP students. As part of CROP, students are admitted to participating post-secondary institutions at the completion of the program and after meeting certain requirements. Even if they participate in CROP at Pasco-Hernando, they can attend any participating institution. Project staff hope that LSAMP will be able to support these students if they chose to attend Pasco-Hernando and may also help in recruiting these students to be Pasco-Hernando students.

Polk State College

Current Status

Polk State College is comprised of two campuses and is the second oldest institution in the alliance. As part of the LSAMP program, Polk State has an advisor who serves as the STEM Club Advisor and the academic advisor. The LSAMP advisor remained in position from the conclusion of the last grant to the new grant, which contributed to the institution's success. At the end of the Fall 2021 semester, Polk State had recruited 52 LSAMP members.¹⁷ Of those LSAMP members, 83% belonged to racially and ethnically minoritized groups. LSAMP members have several requirements including participating in orientation, advising, and at least three engagement opportunities. In total, 53% of students ($n=52$) completed LSAMP orientation, 92% of students ($n=55$) met with their advisor at least once, and 50% ($n=30$) participated in three or more LSAMP activities.

Polk State provided 22 engagement opportunities to their students in Fall 2021. Eighty-six percent of these events ($n=19$) were virtual, which was necessary as project staff reported the majority of courses on campus were still being offered virtually. In addition to STEM Club meetings at all campuses, the college hosted a STEM Career Workshop and a Summer Research Webinar. The college also had student speakers (e.g., students from UCF, students from UF) and STEM professional speakers (e.g., Duke Energy Academy, Meteorologist). Finally, students were invited to attend a lab tour at MOTE Marine Laboratory/Aquarium in Sarasota, Florida.

Institution Successes

Polk State experienced several successes in Fall 2021, which included recruitment, dedicated STEM advising, and student growth.

Recruitment was a success in the first semester of implementation. A primary way that students were recruited was through the First Flight STEM Pathways Information Session. This session occurs during college orientation (i.e., First Flight) and provides a way for project staff to talk with STEM students during their first few days on campus. Project staff were also able to leverage their LSAMP members from the prior grant, many who signed up to be LSAMP members under the new grant.

Advising was also a success at Polk State with 92% of students ($n=55$) meeting with their advisor. Further, Polk State had the most success with students meeting with their advisor multiple times; 18% of students ($n=11$) met with their advisor two times and 18% of students ($n=11$) met with their advisor three times in Fall 2021. Students spoke very positively about the impact of the faculty advisor, noting his door was always open. They described him as the person they trust to provide guidance on navigating college, clarify career aspirations, and decide what institution at which to continue their education. They explained the LSAMP advisor is also there when college becomes difficult, describing him as a “*big influencer*” who supports students

¹⁷ Although Polk State had 52 official LSAMP members, data were reported for up to 60 LSAMP members in some cases.

being successful because of his “*hope*” for them and “*faith*” in them. The advisor explained that he tries to be available for anything students need, even tutoring students, as necessary.

At the college, faculty and students described a strong sense of belonging among students. While describing her time in LSAMP one student said, “*I feel seen. I feel like I’m being heard, and I feel appreciated. I’m so grateful for that.*” Sense of belonging for students comes from faculty members and other LSAMP participants. The STEM Club is a common entry point from which students build relationships with different people. It also provides a place for students to gain support when they are struggling. Students said that they feel like they belong there because there are, “*really amazing efforts in trying to help them [students] as everybody tries.*” Faculty and staff agreed and described LSAMP as “*a family*” that provide opportunities for students to be supported as they become acclimated to the college environment.

Student growth was also described as a success. Faculty observed the growth of students and students described their own growth. Students explained that being able to design, conduct, and present research provided students an opportunity to do something their previously had not seen themselves capable of doing. Further, students shared that they grew academically and as people through involvement in LSAMP. Faculty also agreed that students grew after participating in LSAMP. One faculty member explained, “*they’re not at all aware of how capable they are, and this program directly affects their self-perception as capable STEM professionals...the interest is there, but the confidence is not.*”

Institution Challenges

Challenges in Fall 2021 were related to changes related to the new grant, student academic readiness, recruitment, and the pandemic.

Project staff noted challenges related to working with the alliance under the new grant. They described a learning curve at the start of the grant to understand how this funding round was different than the previous grant. Faculty and staff reported the lack of a permanent project director created the perception that, “*they were still finding their feet*” and caused challenges.

Faculty reported challenges in engaging students in certain opportunities when they did not yet have the skills needed. Faculty noted that when they work with students the students needed support for technical writing and building conference presentations. Further, they wanted to work with students to actively use their voices when giving presentations.

Although project staff were able to successfully recruit 52 LSAMP members, recruitment had to be cut off due to the lack of capacity to provide services to more students. At this institution, the challenge was not that they needed to find more students to serve, instead it was that there were more students who wished to be a part of it than they could serve.

Finally, the pandemic caused challenges with the types of activities that could be offered. Students report they want to participate in face-to-face activities, but it is not always possible due to pandemic related safety concerns. During the student focus group students talked about prior activities that had been offered pre-pandemic. Newer students discussed wanting to have those opportunities as well. One student explained, “*I want to [participate in travel] while I am here at Polk...but of course, I might not get that opportunity.*” The local excursions (e.g., trip to MOTE Marine Lab/Aquarium) were perceived as positive, but students expressed a preference

for the opportunity to engage in activities that required greater travel and access to face-to-face interactions. As one student shared, *“it’s not the same when you compare it to being there in person, being able to be with your peers, your colleagues or advisor.”*

Evidence of Sustainable Efforts

During Fall 2021, Polk State made progress in building organizational capacity. The institution began Fall 2021 with full staff who were familiar with LSAMP. This helped to provide momentum to the new project. Relationships with the involved faculty and staff members encouraged strong participation from students. While recruitment had to be closed in due to capacity, project staff were able to recruit additional students in Spring 2022. Project staff also reported that regardless of funding, the STEM Club would continue as it is ingrained in what Polk State offers to students.

Valencia College

Current Status

Valencia College is comprised of eight campuses. Valencia initiated the work with LSAMP with the first grant and now leads the current grant. As part of the LSAMP program, Valencia has an Implementation Coordinator and three advisor positions that serve different campuses (i.e., East, West, Osceola). At the end of Fall 2021, Valencia had been unable to hire an advisor for the Osceola Campus and the Implementation Coordinator was filling that role. Further, Valencia's Co-principal Investigator was having to serve as the Interim Project Director. In Fall 2021, Valencia recruited 40 LSAMP members across 3 campuses.¹⁸ Of those LSAMP members, 73% belonged to racially and ethnically minoritized groups. LSAMP students are involved at the STEM Clubs that are held on each campus which include the Women in STEM Club on East Campus and the Osceola Young Engineering Association. In total, 89% of students ($n=47$) completed LSAMP orientation. Valencia's advisors were successful: 98% of students ($n=49$) met with their advisor at least once¹⁹ and 18% ($n=15$) participated in three or more LSAMP activities.

Valencia provided 17 engagement opportunities to their students in Fall 2021. Seventy-one percent of these events ($n=12$) were virtual, which was necessary as project staff reported the majority of courses on campus were still being offered virtually. In addition to STEM Club meetings at all campuses, the college hosted career workshops such as:

- *Launch Your Career with LinkedIn - Profiles, Networking, and Informational Interviews*
- *Alternate Routes: Planning Your Career Path Back-Ups-Career Services*
- *Student to Professional: Framing your Academic Experience*

The college also coordinated other workshops, such as *Don't Be Spooked by Summer Research* and *How to Use your Holiday Downtime*. A student panel, *Advice for Students in STEM*, was also held. Finally, students were invited to attend a college tour at the University of Florida that was hosted by programs in the College of Agricultural and Life Sciences and to attend the virtual 2022 Florida Undergraduate Research Conference.

Institution Successes

Valencia experienced several successes in Fall 2021 which included recruitment, engaging students in orientation, and dedicated STEM advising.

Recruitment was a success in the first semester of implementation. Although project staff explained that they did not recruit to the level they expected, by the end of Fall 2021 the college

¹⁸ Valencia had 40 official LSAMP members by the end of Fall 2021. However, data provided includes up to 83 students which include students who were in the STEM Club and not official LSAMP members and students who met with advisors but were not official LSAMP members.

¹⁹ The Student Activity Log only had advising information for 53 of 83 listed students.

had 40 LSAMP members. Project staff and LSAMP members focused on recruitment in Fall 2021, particularly spending time at campus tabling events (i.e., events where students set up a table in a high-traffic area to share information) to “*actually physically be visible*.” Students helped to lead the tabling events to get the word out about LSAMP and recruit other students. Students noted that being visible for recruitment was important, but so was word of mouth, which was described as “*powerful*”.

In addition to successfully recruiting students, 89% of students ($n=47$) completed orientation.²⁰ This success may be attributed to the variety of ways the institution offered orientation (e.g., virtually, in person), including an on-demand version that students could access if they joined late as an LSAMP member. This orientation was regarded as very important by project staff who explained that in addition to orienting students to what the LSAMP program was all about and opportunities within the program, it also served as an opportunity for project staff to explain that students were now part of a community in STEM. This perspective was echoed by faculty, who explained that orientation helps students understand that they are not alone and supports them in gaining a sense of o]].

Advising was a success, with the majority of students (98%) meeting with their advisor at least once and students reporting benefits of the dedicated STEM advising. Students reported it was important to have dedicated advisors because they are more accessible than the non-LSAMP advisors and are trusted for their advice and honesty. Project staff elaborated on this, explaining that a lot of work advisors do is broader than just advising about academics. To meet each student’s needs, advisors may talk with parents about FAFSA or support students in talking to their parents about different situations (e.g., changes in career paths). Staff explained that the role of the advisor is to be “*committed, dedicated, and just going above and beyond to help the students reach their goal*.” Comments from students supported the success of advising, with students explaining personal stories of how advisors had supported them and helped them to reach their goals.

There was some progress with student engagement during the first semester of implementation. Currently, the STEM Club on East Campus is completely student run. Project staff noted that in that club, students decide on and plan all events. As several student-focused fidelity indicators are related to student-led activities, this is excellent progress.

Finally, faculty and staff noted benefits from participation in LSAMP for students and faculty. They explained how LSAMP is a rewarding experience through the sense of belonging it gives students as well as how faculty and staff involved with the program benefit. They spoke of how LSAMP has been discussed at college wide meetings as well as how receptive college leadership has been to LSAMP. Finally, they shared how rewarding it is to have a mentee receive other opportunities because of the foundation laid during LSAMP involvement.

Institution Challenges

The LSAMP program at Valencia experienced a few challenges during Fall 2021. Although Valencia successfully recruited 40 LSAMP members, project staff reported they have the capacity to serve more students and were disappointed there were not more LSAMP members. The college experienced low student engagement, noted challenges with recruiting faculty to

²⁰ The Student Activity Log only had advising information for 53 of 83 listed students.

participate, and had difficulty filling all open staff roles. Many of the challenges were related to the ongoing pandemic.

While progress was made in student recruitment, Valencia College did not meet its recruitment target, and opinions varied as to the reason for lower-than-expected recruitment. Project staff did not provide a target number for recruitment, but noted that they did not make as much progress with recruitment as they would have liked. Staff recognized that part of the challenge was related to the pandemic. Specifically, staff noted that when students were not on campus it was more difficult to engage them early. They also shared that students were not responsive to virtual invitations. Students and faculty agreed that recruitment had been a challenge but felt that the challenges were related to advertising and getting information out about the opportunity. Faculty noted that part of this challenge was a need to build awareness among faculty members to connect students with LSAMP.

The pandemic also caused issues with engaging students. Advisors explained it had been more difficult to engage students with the continued virtual activities and keep them *“motivated”*. As previously noted, LSAMP members are required to participate in three or more engagement opportunities per semester. However, only 18% of Valencia students ($n=15$) met this requirement. Project staff reported that challenges with engaging students relate back to the pandemic (e.g., lack of technology, lack of internet, Zoom fatigue) and the brief period of time activities were able to be offered (i.e., October through December).

Further, staff anticipated the pandemic would become a challenge in recruiting faculty to serve as mentors. They noted that *“fatigue is a much bigger factor”* when recruiting faculty. Structural changes at the college have further compounded this concern. Project staff explained, *“it is hard now to ask people to add in one more thing, because traditionally faculty mentors have supported LSAMP as part of their service to the college.”* Now that it is no longer a requirement, project staff are concerned recruiting faculty to work with LSAMP students will be difficult. They recognize that while faculty are in support of LSAMP goals, they may not have the time to support the program. Project staff shared that the stipends available in the new grant may help, but they remain concerned about engaging faculty.

Finally, staffing has been a challenge. The Co-principal Investigator of Valencia’s LSAMP program had to serve as the Interim Project Director for the entire program throughout Fall 2021 and remained in that position through the end of March 2022. Two of the LSAMP advisor positions were vacant for the first part of Fall 2021, but an East Campus advisor was hired. However, despite searching they have not been able to hire the final LSAMP advisor and the implementation coordinator is currently filling that role. It is unclear why institutions experienced difficulty with hiring in Fall 2021.

Evidence of Sustainable Efforts

Several sustainable efforts emerged during Fall 2021. These included the advising positions being reorganized within the college and development of infrastructure.

During Fall 2021, LSAMP advisors were rehoused under a new department, Partnerships for Educational Equity office. This office is also home to the Co-principal investigator. Project staff reported this was an important change from when the grant first started. When the advisors

were housed in Student Services, they often were asked to fill other roles. In the new structure, LSAMP advisors can solely focus on LSAMP instead of other duties.

The project has made progress building infrastructure at the college, specifically with implementation teams and partnering with other programs. Project staff reported that institution specific implementation teams had not been formalized yet, but they were meeting and had processes and contacts for different responsibilities throughout the college. Further, the LSAMP program continues to partner with other programs at the institution such as VECTOR,²¹ which project staff report helps to build institutional capacity.

²¹ Valencia Engaging for Completion Through Opportunities in Research (VECTOR) is an S-STEM project supported by the National Science Foundation (NSF). <https://valenciacollege.edu/finaid/programs/scholarships/vector/>



Chapter Four: Recommendations

Recommendations

Based on findings from the first semester of implementation, the following recommendations are made:

Recruitment

- 1. Consider additional recruitment strategies to intentionally recruit students from racially and ethnically minoritized groups:** Individual institutions have begun to think about how to better target students from these groups. For example, at Polk State, LSAMP is the featured program for their school counselor luncheon. This ensures school counselors at nearby high schools are aware of the LSAMP program and can guide students who fit the targeted profile of an LSAMP student to the institution and share the benefits of the program with their students. Similarly, Pasco-Hernando has been working on coordinating efforts with two of their pre-collegiate programs that target students in grades 3-12 to increase recruitment. The alliance could replicate these activities at all institutions. Other options may include sending LSAMP members to local high schools to talk about their experiences, developing a recruitment video featuring LSAMP members to share broadly, or sending information about LSAMP to local college fairs.
- 2. Prepare a brief presentation on LSAMP to share with appropriate faculty/staff at each institution about LSAMP:** Project staff noted the importance of ensuring faculty and staff at each institution knew what LSAMP was so they could guide students to this opportunity. Collaboratively the alliance may wish to consider preparing a brief presentation on LSAMP. This presentation could be developed as a template with some generic information but provide space for project staff at each institution to insert institution-specific information. Once developed, this information can be shared with advisors, appropriate campus offices, and STEM faculty. If not possible to meet with these parties, development of a one-page fact sheet may suffice.
- 3. Prioritize students from racially and ethnically minoritized groups for STEM Professionalization Experiences:** The alliance did not meet their target of 90% of LSAMP members being from racially and ethnically minoritized groups. Project staff explained that challenges with recruitment in general, such as having more difficulty connecting with students and students not being on campus, contributed to this. Project staff plan to prioritize students who belong to these groups for STEM Professionalization Experiences and should prioritize these students to align with the goals of LSAMP.

Student Engagement

- 1. Develop an alliance-wide orientation presentation:** Project staff have shared how important orientation is for building a sense of community among LSAMP members. Institutions achieved various levels of success with providing orientation to all students. The alliance may wish to utilize some of the previously created orientation materials at institutions to develop an alliance-wide presentation that can be customized by each institution. This would support newer institutions with providing an official orientation.

This presentation could also be turned into an online module, to be completed asynchronously to further support students in meeting this requirement.

2. **Share engagement opportunities with other institutions:** During Fall 2021, the alliance held 45 different engagement opportunities. The majority of these opportunities were virtual. Based on a review of the opportunities provided, a portion of these would have been good candidates to share with other institutions (e.g., STEM speakers). Connecting the STEM Club advisors would allow them to share opportunities across the alliance. This would provide students with more ways to get involved.
3. **Partner alliance institutions to plan activities such as STEM lab/industry tours and college tours.** Tours require significant planning and coordination yet are very beneficial for students. The alliance may wish to partner each of the more established institutions (i.e., Valencia, Polk State) with one of the newer institutions (i.e., College of Central Florida, Pasco-Hernando) to collaborate in planning these vital activities. Institutions could partner to select locations for tours while planning and coordinating the tour could be a rotating responsibility. This would enable institutions to plan these activities with less effort and potentially allow them to happen more frequently. Partnering a newer institution and an older institution would also keep the numbers of potential students more manageable.

Faculty Focused Activities

1. **Continue to provide time for CFSA Work Groups to connect and report at quarterly meetings:** Providing time for CFSA Work Groups to connect and report at quarterly meetings provides accountability and a sense of importance. CFSA Work Groups experienced challenges in Fall 2021 due to staff turnover and a need to focus on student focused activities. Providing time and setting clear expectations at the next several meetings will support these groups in getting established and making progress. In between meetings, it may be beneficial to reach out to groups for updates.

Evaluation and Reporting

1. **Revise evaluation forms to align with other reporting requirements:** Prior to the Fall 2022 semester, evaluation forms should be revised to align with other reporting requirements and to ease the burden on project staff as much as possible.
2. **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. Clarifying the role of these forms with staff who are responsible for data collection will be important to ensure a successful evaluation.
3. **Encourage staff members to track activities during the semester:** The evaluation logs were a new aspect of the evaluation in Fall 2021. Encouraging staff members to track activities on these logs during the semester should ease the burden of providing the data at the end of each semester.



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



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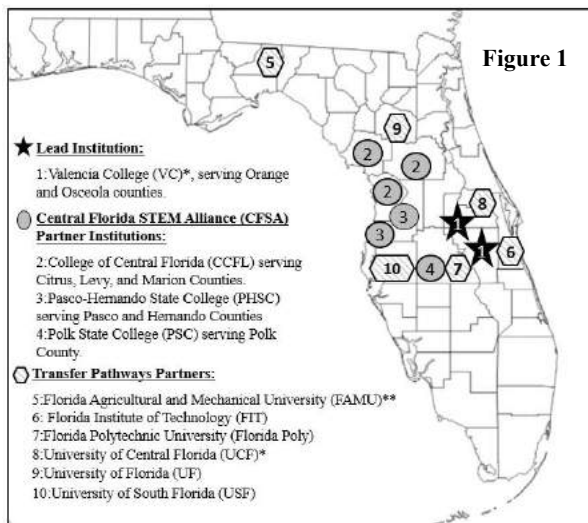
INTRODUCTION

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

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.

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.

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.
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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

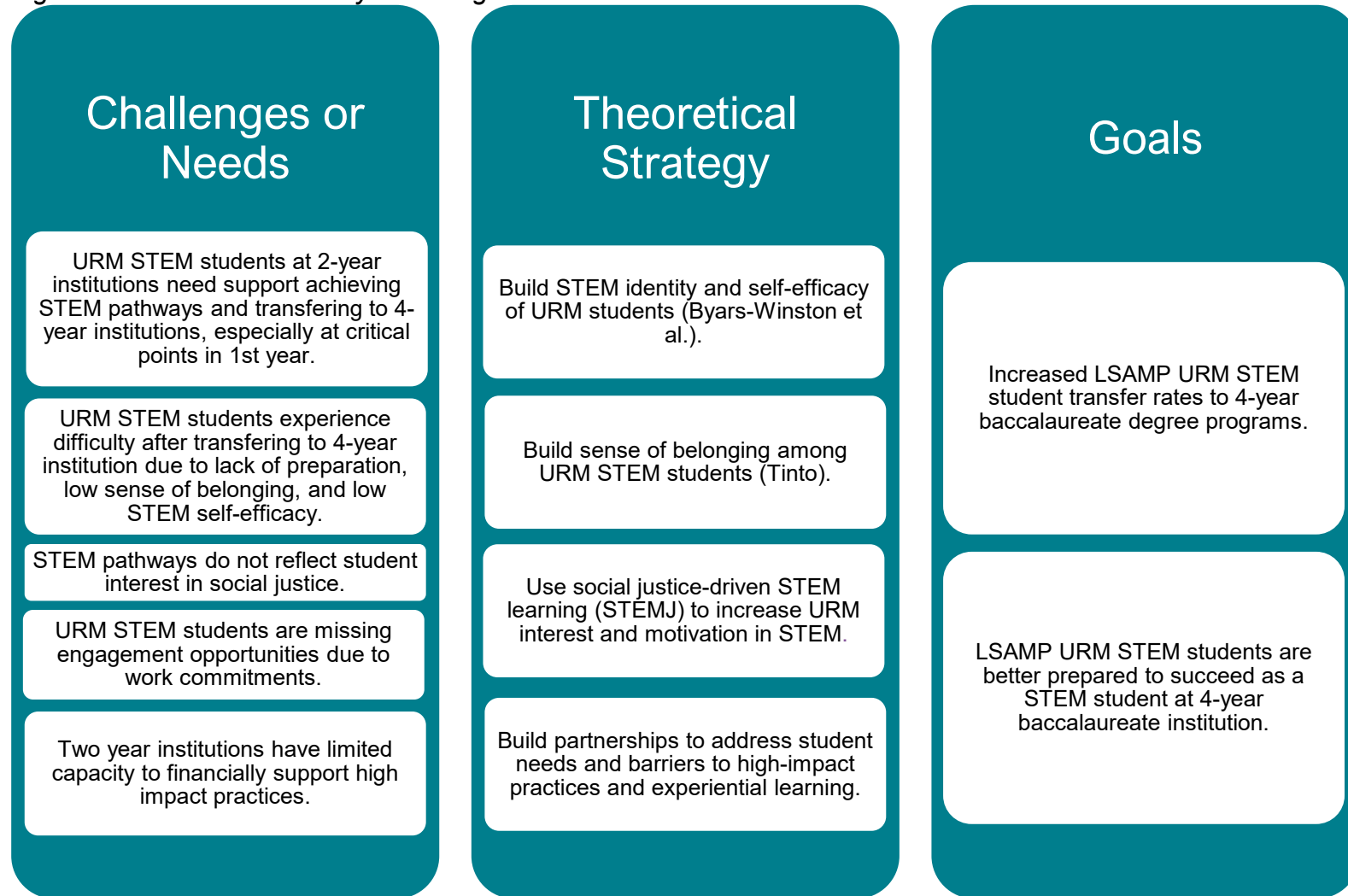
The challenges or needs the program addresses focus on building STEM² pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.³ Contributing to these larger challenges are a lack of preparation, low sense of belonging, low STEM self-efficacy, 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 <i>Skill-focused</i>	# 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 <i>Persuasion/modeling focused</i>	# 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 URM	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 URM (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 <i>Persuasion and modeling focused</i>	# 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
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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 determines 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"		
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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 URM students 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)		
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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 LSAMP 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	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 2	Pasco-Hernando State College	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 3	Valencia College	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group • IR Meeting
Day 4	Polk State College	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 1 PM	Pasco-Hernando State College	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 2 AM	Valencia College	<ul style="list-style-type: none"> • Grant Team Interview • Student Focus Group • Faculty Focus Group
Day 2 PM	Polk State College	<ul style="list-style-type: none"> • 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.

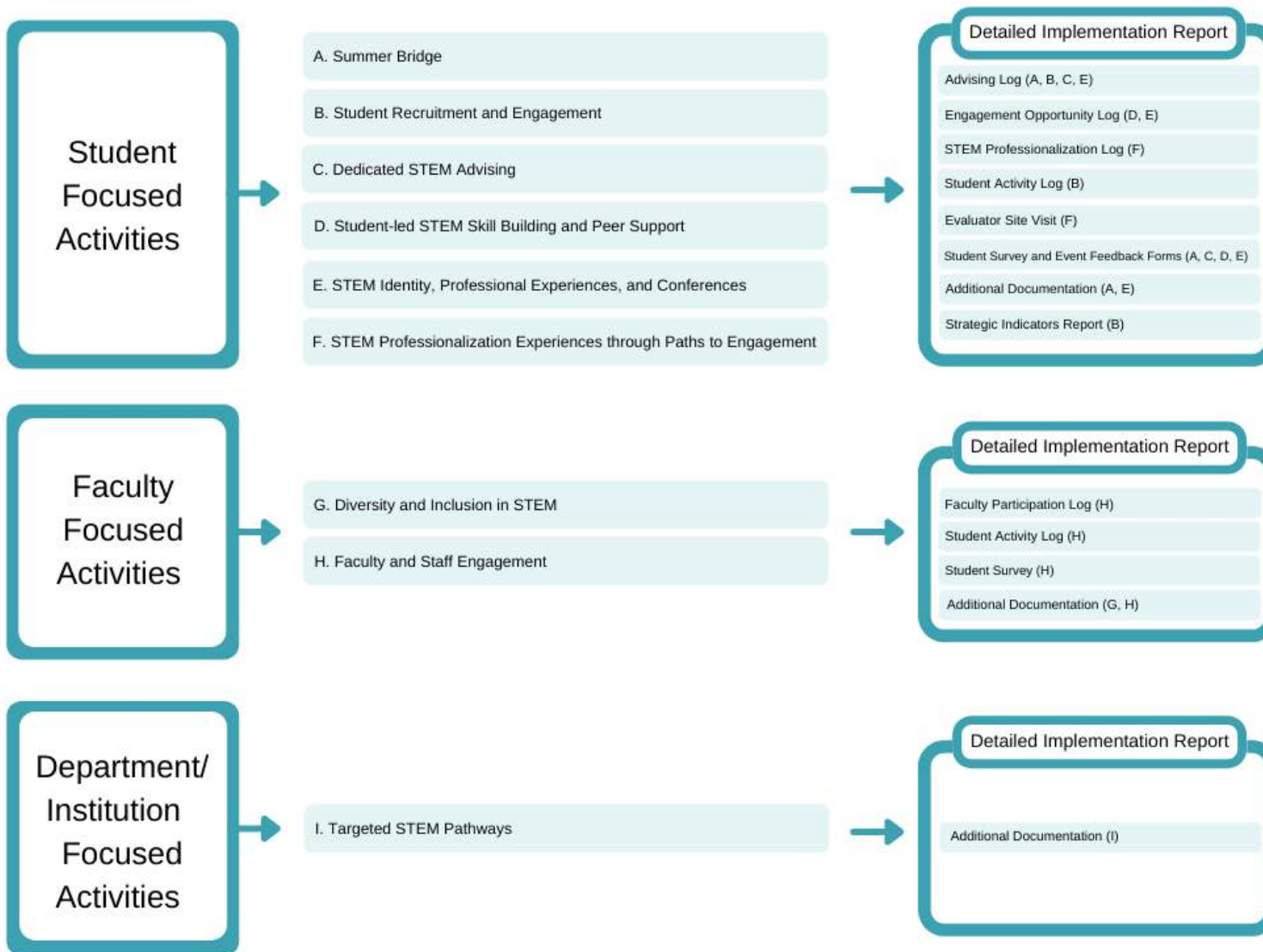
TASK 6: Communication and Reporting

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?		<ul style="list-style-type: none"> Rosters of Summer STEM Institute Program 	
How many workshops and presentations by STEM professionals and college/university faculty were offered?		<ul style="list-style-type: none"> 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?		<ul style="list-style-type: none"> 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?		<ul style="list-style-type: none"> Schedule from Summer STEM Institute 	

		<ul style="list-style-type: none"> • Various documentation (e.g., photos) 	
<i>Were activities on STEM Career Pathways included in the Summer STEM Institute?</i>		<ul style="list-style-type: none"> • Schedule from Summer STEM Institute 	
<i>Was information on institutional resources and tools to support college readiness and success shared at the Summer STEM institute?</i>		<ul style="list-style-type: none"> • Schedule from Summer STEM Institute • Various documentation (e.g., photos, copies of resources) 	
<i>Were activities the UN Sustainable Development Goals included in the Summer STEM Institute?</i>		<ul style="list-style-type: none"> • Schedule from Summer STEM Institute 	
<i>Did students develop projects to support attainment of the UN SDGs in their local communities?</i>		<ul style="list-style-type: none"> • Schedule from Summer STEM Institute • Roster of students with project status 	
<i>What % of students completed mathematics assessments to determine their math skill level?</i>		<ul style="list-style-type: none"> • De-identified student-level records with assessment scores 	
<i>What % of students met with a STEM advisor to discuss math course placement?</i>		<ul style="list-style-type: none"> • Spreadsheet with student participation (i.e., advisor meetings, activities) by student 	
<i>Is a math course waiver option available for students who completed advising and necessary standardized tests/assessments at your institution?</i>		<ul style="list-style-type: none"> • Documentation (e.g., student information packet, roster of students who earned course waivers) of 	

		<i>course waiver opportunity</i>	
<i>How many students utilized course waivers (if applicable)?</i>		<ul style="list-style-type: none"> <i>Advising Log</i> 	
SF 3: Student Recruitment and Engagement			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>What percent of LSAMP students participated in orientation?</i>		<ul style="list-style-type: none"> <i>Student Activity Log</i> 	
<i>What percent of LSAMP students belong to racially and ethnically minoritized groups?</i>		<ul style="list-style-type: none"> <i>Roster of LSAMP Students with race/ethnicity</i> 	
<i>What percent of LSAMP students met with advisors at least one time this semester?</i>		<ul style="list-style-type: none"> <i>Advising Log</i> 	
<i>What percent of LSAMP students participated in at least 3 LSAMP experiences this semester?</i>		<ul style="list-style-type: none"> <i>Student Activity Log</i> 	
SF 4: Dedicated STEM Academic Advising			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>What percent of LSAMP students worked with academic advisors to develop educational plans or academic transfer plans?</i>		<ul style="list-style-type: none"> <i>Advising Log</i> 	
<i>What percent of LSAMP students met with advisors who</i>		<ul style="list-style-type: none"> <i>Advising Log</i> 	

<i>discussed CFSA engagement opportunities?</i>			
<i>What percent of LSAMP students met with advisors who referred them to other departments?</i>		<ul style="list-style-type: none"> • <i>Advising Log</i> 	
<i>What percent of LSAMP students flagged at risk met with advisors over retention concerns?</i>		<ul style="list-style-type: none"> • <i>Advising Log</i> 	
SF 5-6 : Student-led STEM Skill Building and Peer Support			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>Did LSAMP students (including Peer Coaches and STEM club members) lead presentations and engagement opportunities for other LSAMP students and the broader STEM community?</i>		<ul style="list-style-type: none"> • <i>LSAMP Engagement Opportunity Log</i> 	
<i>Did Peer Coaches and STEM Club members facilitate informal support sessions for peers?</i>		<ul style="list-style-type: none"> • <i>LSAMP Engagement Opportunity Log</i> 	
<i>Were STEM skill-building workshops and peer supports offered virtually or did they use technology to engage students across institutions?</i>		<ul style="list-style-type: none"> • <i>LSAMP Engagement Opportunity Log</i> 	
<i>Did Peer Coaches facilitate study groups, activities, or mentor students in completion of research projects?</i>		<ul style="list-style-type: none"> • <i>LSAMP Engagement Opportunity Log</i> 	
<i>Did students lead activities (e.g., group study sessions,</i>		<ul style="list-style-type: none"> • <i>LSAMP Engagement Opportunity Log</i> 	

tutoring in STEM subjects, peer-led workshops)?			
SF 7-9: STEM Identity, Professional Experiences, and Conferences			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>Were on-campus and virtual workshops offered to learn about STEM careers, enhance STEM identity, and expand STEM networks?</i>		<ul style="list-style-type: none"> Engagement Opportunity Log 	
<i>How did your institution promote STEM Student community and support student interaction, workshops, and presentations by STEM professionals?</i>		<ul style="list-style-type: none"> Documentation of promotion (e.g., Newsletter) 	
<i>How did LSAMP team members support students in competing for national research and internship opportunities?</i>		<ul style="list-style-type: none"> Advising Log 	
<i>Did students attend the annual STEM Summit?</i>		<ul style="list-style-type: none"> Roster of STEM Summit attendees 	
<i>How many students attended national STEM conferences?</i>		<ul style="list-style-type: none"> List of students who attended or presented at STEM conferences 	
<i>How did LSAMP team members support students in submitting proposals to national STEM conferences?</i>		<ul style="list-style-type: none"> List of students who attended or presented at STEM conferences Documentation (e.g., workshop fliers, newsletter) 	

<i>Were in-person and virtual lab tours offered in STEM discipline areas at 4-year institutions?</i>		<ul style="list-style-type: none"> • <i>List of college and industry tours</i> • <i>Rosters from in-person and virtual lab tours</i> 	
<i>Were in-person and virtual STEM tours offered in STEM industry areas?</i>		<ul style="list-style-type: none"> • <i>List of college and industry tours</i> • <i>Rosters from in-person and virtual industry tours</i> 	
<i>Were college tours offered at university partners' institutions?</i>		<ul style="list-style-type: none"> • <i>List of college and industry tours</i> • <i>Rosters from college tours</i> 	
SF 7-9: STEM Identity, Professional Experiences, and Conferences			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>Were LSAMP research scholars selected and awarded funding?</i>		<ul style="list-style-type: none"> • <i>Roster of LSAMP Research Scholars</i> 	
<i>What percent of LSAMP Research Scholars conducted research on-campus or through external placements with industry or university partners?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>What percent of LSAMP Research Scholars engaged in the minimum 40-hour research, internship, or lab experience requirement?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>What percent of LSAMP Research Scholars presented work at the LSAMP Showcase?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	

<i>Were Community Interns selected and awarded funding?</i>		<ul style="list-style-type: none"> • <i>Roster of Community Interns</i> 	
<i>What percent of Community Interns engaged in the minimum 25-hour internship?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>What percent Community Interns presented internship experiences as artifacts?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>Were Peer Coaches selected and awarded funding?</i>		<ul style="list-style-type: none"> • <i>Roster of LSAMP Research Scholars</i> 	
<i>What percent of Peer Coaches led/developed workshops and other opportunities?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>What percent of Peer Coaches engaged in the minimum 40-hours of peer support?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	
<i>What percent of Peer Coaches presented work at the LSAMP Showcase?</i>		<ul style="list-style-type: none"> • <i>STEM Professionalization Experience Log</i> 	

Faculty Focused Activities			
FF 1: Diversity and Inclusion in STEM			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>Were workshops offered to faculty to support the engagement of URM students in STEM and undergraduate research?</i>		<ul style="list-style-type: none"> • <i>Agendas from faculty workshops</i> 	
<i>How many faculty members participated in workshops?</i>		<ul style="list-style-type: none"> • <i>Rosters of faculty workshop attendees</i> 	

FF 2-4: Faculty and Staff Engagement			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>How many faculty members served as research mentors?</i>		<ul style="list-style-type: none"> • <i>Student Activity Log</i> • <i>Faculty Participation Log</i> 	
<i>How many faculty members participated in the Summer STEM Institute?</i>		<ul style="list-style-type: none"> • <i>Roster of faculty participation</i> 	
<i>How many faculty members participated in STEM clubs, conferences, field trips, and other activities?</i>		<ul style="list-style-type: none"> • <i>Roster of faculty participation</i> 	
<i>What percentage of faculty participate in CFSA working groups?</i>		<ul style="list-style-type: none"> • <i>Faculty Participation Log</i> 	
<i>What percentage of faculty participate in institution-specific implementation teams?</i>		<ul style="list-style-type: none"> • <i>Faculty Participation Log</i> 	
<i>Did faculty have opportunities to connect across institutions?</i>		<ul style="list-style-type: none"> • <i>List of opportunities for faculty to connect</i> • <i>Roster of attendees</i> 	

Department/Institution Focused Activities			
DIF 1-2: Targeted STEM Pathways			
Question	Evidence	Required Artifacts	Additional Artifacts
<i>Were steps taken to develop articulation agreements with expanded university partners?</i>		<ul style="list-style-type: none"> <i>Copies of articulation agreements</i> 	
<i>Were steps taken to develop STEM degree pathways with university partners?</i>		<ul style="list-style-type: none"> <i>Documentation of STEM degree pathways</i> 	
<i>Were steps taken to develop data sharing agreements with university partners?</i>		<ul style="list-style-type: none"> <i>Copies of data sharing agreements</i> 	
<i>Were there regular meetings of the Assessment and Evaluation group?</i>		<ul style="list-style-type: none"> <i>Agendas</i> <i>Attendance rosters</i> 	

Strategic Indicators Report

Central Florida STEM Alliance Strategic Indicators Year 1

Institution:

Year:

Strategic Indicators	Current Measure	Data Source
SI.1: How many LSAMP URM students 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)
<i>Valencia</i>	<i>2021-2022</i>	<i>Dr. Cindy Robbins</i>	<i>Biology</i>	<i>Y</i>	<i>Evaluation</i>	<i>Y</i>

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)
<i>Valencia</i>	<i>2021-2022</i>	<i>10000000</i>	<i>Research Scholar</i>	<i>Fall 2021</i>	<i>Biology Lab</i>	<i>45</i>	<i>Y</i>

Student Activity Log

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

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

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 attributed 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 Advising				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 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
 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.
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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
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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.
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- Listened when you talked.
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- 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

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/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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- 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

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)

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- 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 your 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 your 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 your 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 your 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 your 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 your 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 your 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 your 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 your 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 your 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 be 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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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 incentivizes 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.

Process Evaluation

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?

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 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:

☐ 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.

☐ 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.

Figure 1. Number of Students per Data Source by Institution, Fall 2021

	Advising Log	Student Activity Log	Orientation Data	Total Number of LSAMP Members
Central Florida	6	7	7	7
Pasco-Hernando	N/A	N/A	N/A	No Students in Fall 2021
Polk State	60	60	60	53
Valencia	50*	83	53	40

*Note: Advising meeting dates were provided for 50 students, representing two campuses. However, information on advising topics was only provided for 5 of these 50 students (10% of the students in the log). Data were not analyzed as the small number of students would provide skewed data.

Table 1. Student Focused Fidelity of Implementation Matrix 1: Summer Bridge

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					Reported beginning in Year 2
SF 1.2: Summer STEM Institute includes workshops and	Number of workshops and presentations by STEM	Detailed Implementation Report; Schedule					Reported beginning in Year 2

presentations by STEM professionals and college/university faculty.	professionals and college/university faculty	from Summer STEM Institute					
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					Reported beginning in Year 2
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)					Reported beginning in Year 2
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					Reported beginning in Year 2
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)					Reported beginning in Year 2
SF 1.7: Summer STEM Institute includes activities to learn about the UN Sustainable Development	Evidence of activities on the UN-SDGs at the Summer STEM Institute	Detailed Implementation Report; Schedule from Summer STEM Institute					Reported beginning in Year 2

Goals (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					Reported beginning in Year 2
SF 1.9: Students are satisfied with the Summer Bridge experience.	% of students satisfied with Summer Bridge	Detailed Implementation Report; Student feedback survey					Reported beginning in Year 2

SF 1.1-SF 1.9: Summer Bridge is scheduled for Summer 2022 and will be reported in Year 2.

Table 2. Student Focused Fidelity of Implementation Matrix 2: Appropriate Math Course Placement

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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 (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					Reported beginning in Year 2
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					Reported beginning in Year 2
SF 2.3: Students can earn math course waivers after successful completion of math advising and the necessary	Evidence of math course waiver opportunity	Detailed Implementation Report; Documentation (e.g., student information packet, roster of students who					Reported beginning in Year 2

standardized tests/assessments.		earned course waivers) of course waiver opportunity					
	# of students who utilized math course waivers	Detailed Implementation Report; Advising Log					Reported beginning in Year 2

SF 2.1-2.3: This activity occurs during Summer Bridge. It is scheduled for Summer 2022 and will be reported in Year 2.

Table 3. Student Focused Fidelity of Implementation Matrix 3: Student Recruitment and Engagement

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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	100% of students ($n=7$) completed orientation (Source: Student Activity Log, $n=7$).	Pasco Hernando did not have LSAMP members in Fall 2021.	53% of students ($n=32$) completed orientation (Source: Student Activity Log, $n=60$).	89% of student ($n=47$) completed orientation (Source: Student Activity Log, $n=53$).	72% of students ($n=86$) across the alliance completed orientation (Source: Student Activity Log, $n=120$).
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	Detailed Implementation Report; Strategic Indicators Report	14% of LSAMP members ($n=1$) belong to a racially and ethnically minoritized group (Source: Demographic Information, $n=7$).	Pasco Hernando did not have LSAMP members in Fall 2021.	83% of LSAMP members ($n=43$) belong to a racially and ethnically minoritized group (Source: Demographic Information, $n=52$).	73% of LSAMP members ($n=29$) belong to a racially and ethnically minoritized group (Source: Demographic Information, $n=40$).	74% of LSAMP members ($n=73$) belong to a racially and ethnically minoritized group (Source: Demographic Information, $n=99$).
SF 3.3: Students meet with advisors at least 1 time per semester.	% of students who meet with their advisor at semester.	Detailed Implementation Report; Advising Log	100% of students ($n=6$) met with their advisor at least	Pasco Hernando did not have LSAMP	92% of students ($n=55$) met with their advisor at least once in Fall	98% of students ($n=49$) met with their advisor at least once in Fall	95% of students ($n=110$) across the alliance met with their advisor

	least 1 time per semester		once in Fall 2021 (Source: Advising Log, $n=6$).	members in Fall 2021.	2021 (Source: Advising Log, $n=60$).	2021 (Source: Advising Log, $n=50$).	at least once in Fall 2021 (Source: Advising Log, $n=116$).
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	100% of students ($n=7$) participated in 3 or more LSAMP experiences in Fall 2021 (Source: Student Activity Log, $n=7$).	Pasco Hernando did not have LSAMP members in Fall 2021.	50% of students ($n=30$) participated in 3 or more LSAMP experiences in Fall 2021 (Source: Student Activity Log, $n=60$).	18% of students ($n=15$) participated in 3 or more LSAMP experiences in Fall 2021 (Source: Student Activity Log, $n=83$).	35% of students ($n=52$) across the alliance participated in 3 or more LSAMP experiences in Fall 2021 (Source: Student Activity Log, $n=150$).

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021.

SF 3.1: The percent of students attending orientation at each institution varied. The College of Central Florida, with the smallest number of LSAMP members, had 100% of members complete orientation. 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.

SF 3.2 The percent of LSAMP members who belonged to racially and ethnically minoritized groups varied by institution. Across the alliance, 74% of LSAMP members ($n=73$) 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 in Fall 2021.

SF 3.4: The percent of students participating in at least 3 LSAMP experiences varied across institutions. As a newer institution, the College of Central Florida had the smallest number of LSAMP members ($n=7$) and the smallest number of events ($n=6$) but was able to engage 100% of their LSAMP members in at least 3 LSAMP experiences. Valencia and Polk held the largest number of events, with 17 events being held at Valencia and 22 at Polk in Fall 2021. However, not all LSAMP students attended three activities. This may be related to implementation challenges experienced during the first semester of funding. Several participating institutions had difficulty with hiring staff and getting started with implementation. Further, because of the requirements of the new grant, there were no pre-existing LSAMP members. Regardless of whether students were LSAMP members under the prior grant, they needed to reapply. Due to this factor, the majority of orientation events happened in mid to late October 2021, leaving only a month and a half for activities to occur during the fall term.

Table 4. Student Focused Fidelity of Implementation Matrix 4: Dedicated STEM Academic Advising

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia Status	Alliance Status
SF 4.1: Academic advisors engage LSAMP students in establishing educational plans and transfer plans.	% of students who developed educational plans/transfer plans with their advisor.	Detailed Implementation Report; Advising Log	100% of students ($n=6$) developed educational or transfer plans with their advisor (Source: Advising Log, $n=6$).	Pasco Hernando did not have LSAMP members in Fall 2021.	98% of students ($n=59$) developed educational or transfer plans with their advisor (Source: Advising Log, $n=60$).	Data were only provided for 5 students; data are inconclusive.	98% of students ($n=65$) across the alliance developed educational or transfer plans with their advisor (Source: Advising Log, $n=66$).
SF 4.2: Academic advisors engage LSAMP students in identifying and preparing for CFSA engagement opportunities.	% of students whose advisor discussed CFSA engagement opportunities in advising meetings.	Detailed Implementation Report; Advising Log	Specified categories were not used; data are inconclusive.	Pasco Hernando did not have LSAMP members in Fall 2021.	20% of students ($n=12$) discussed research/internship opportunities. 5% of students ($n=3$) discussed conference attendance opportunities (Source: Advising Log, $n=60$).	Data were only provided for 5 students; data are inconclusive	Data were only available for one institution.
SF 4.3: Academic advisors refer LSAMP students to other departments.	% of students whose advisor referred them to other departments.	Detailed Implementation Report; Advising Log	Specified categories were not used; data are inconclusive.	Pasco Hernando did not have LSAMP members in Fall 2021.	3% of students ($n=2$) were referred to other departments (Source: Advising Log, $n=60$).	Data were only provided for 5 students; data are inconclusive	Data were only available for one institution.
SF 4.4: Academic advisors respond to retention concerns.	% of students flagged at risk for retention who met with advisor over retention concerns.	Detailed Implementation Report; Advising Log	Advisor indicated no LSAMP students were flagged for retention (Source: Advising Log).	Pasco Hernando did not have LSAMP members in Fall 2021.	Data were not provided.	Data were only provided for 5 students; data are inconclusive	Data were only available for one institution.
SF 4.5: Students are satisfied with dedicated STEM academic advising.	% of students satisfied with STEM academic advising	Detailed Implementation Report; Student Survey					Reported beginning in Year 2.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021. Valencia is not included in the following descriptions as data were not provided for the majority of students. Further, information on advising topics were only provided for 5 of the 50 students (10% of the students) in the log. Data were not analyzed as the small number of students would provide skewed data.

SF 4.1: The majority of students (98%) at Polk State and all students at the College of Central Florida established educational plans and transfer plans with their advisor. At Polk State, the advisor reported establishing transfer plans and educational plans with students. The advisor at the College of Central Florida established educational plans and met with students prior to spring term registration.

SF 4.2: The only institution that had all data available included on the advising logs was Polk State. 20% of students (n=12) discussed research/internship opportunities and 5% of students (n=3) discussed conference attendance opportunities with their advisor.

SF 4.3: The only institution that had all data available included on the advising logs was Polk State. 3% of students (n=2) were referred to other departments by their advisor.

SF 4.4: At the College of Central Florida, the advisor indicated that no students were flagged for retention. Information was not reported at other institutions. During project staff interviews with all institutions that currently have LSAMP members, project staff noted that they are notified as soon as students are flagged for retention and would then follow up immediately. At Polk State, the advisor further explained that he typically knows if a student will be flagged for retention in advance because he is so involved with the students and their academic progress.

SF 4.5: Students will report on their satisfaction with dedicated STEM advising in Spring 2022. This will be reported in Year 2.

Table 5. Student Focused Fidelity of Implementation Matrix 5: Student-led STEM Skill Building and Peer Support

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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	6 different events were led by students (or a combination of students and others) in Fall 2021 (Source: Engagement Opportunity Log).	Pasco Hernando did not have LSAMP members in Fall 2021.	17 different events were led by students (or a combination of students and others) in Fall 2021 (Source: Engagement Opportunity Log).	1 event was led by a combination of students and faculty/staff. STEM Club Members also led STEM Club meetings (Source: Engagement Opportunity Log, Detailed Implementation Report).	24 different events were led by students (or a combination of students and others) across the alliance in Fall 2021 (Source: 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	Detailed Implementation Report; Engagement Opportunity Log	Informal support sessions were not held in Fall 2021 (Source: Engagement Opportunity Log).	Pasco Hernando did not have LSAMP members in Fall 2021.	Informal support sessions were not held in Fall 2021 (Source: Engagement Opportunity Log).	STEM Club Members held a student panel entitled "Advice for Success in STEM"(11/5/21; Source: Engagement Opportunity Log).	Data were only available for one institution.
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	6 different events were held virtually in Fall 2021 (Source: Engagement Opportunity Log).	Pasco Hernando did not have LSAMP members in Fall 2021.	19 different events were held virtually in Fall 2021 (Source: Engagement Opportunity Log).	12 different events were held virtually in Fall 2021 (Source: Engagement Opportunity Log).	37 different events were held virtually across the alliance in Fall 2021 (Source: 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	Detailed Implementation Report; Event Feedback Forms					Reported beginning in Year 2.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021.

SF 5.1: All institutions held at least one student led event in Fall 2021. The majority of events ($n=16$) were led by students and faculty/staff members. At Polk, 6 events were led by students on their own.

SF 5.2: At the majority of institutions, informal support sessions were not led by students. These opportunities are intended to be led by STEM Club Members and Peer Coaches. However, Peer Coaches will not be selected until Spring 2022. One informal support session was held at Valencia in Fall 2021. The number of opportunities is expected to increase once Peer Coaches are selected.

SF 5.3: Institutions held a variety of virtual events to engage students. However, it is not clear if students at other institutions were involved. The majority of events that were held in Fall 2021 were virtual.

SF 5.4: Students will report on their satisfaction with student-led STEM skill building workshops and peer supports in Spring 2022. This will be reported in Year 2.

Table 6. Student Focused Fidelity of Implementation Matrix 6: Peer-led Supports

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					Reported beginning in Year 2.
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	Students did not lead peer support activities in Fall 2021 (Source: Engagement Opportunity Log).	Pasco Hernando did not have LSAMP members in Fall 2021.	Students did not lead peer support activities in Fall 2021 (Source: Engagement Opportunity Log).	Students led a Osceola Young Engineers Association Meeting and Study Session (10/11/21; Source: Engagement Opportunity Log).	Data were only available for one institution.
SF 6.3: Students are satisfied with peer-led supports.	% of students satisfied with peer-led supports	Detailed Implementation Report; Event Feedback Forms					This activity will begin and be reported in Year 2.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021.

SF 6.1 LSAMP members are not eligible to become Peer Coaches until they have been a member for a full semester. Peer Coaches will be selected in Spring 2022 and this activity will be reported on in Year 2.

SF 6.2: Valencia students led a meeting and study session in Fall 2021.

SF 6.3: The one event that is included in this category occurred prior to implementation of the feedback form. Although Valencia students led a peer-support activity, the feedback form was not in place at that time. Data will be reported in Year 2.

Table 7. Student Focused Fidelity of Implementation Matrix 7: STEM Identity

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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	6 workshops were offered in Fall 2021 (Source: Engagement Opportunity Log)	Pasco Hernando did not have LSAMP members in Fall 2021.	5 workshops were offered in Fall 2021 (Source: Engagement Opportunity Log, Detailed Implementation Report).	6 workshops were offered in Fall 2021 (Source: Engagement Opportunity Log, Detailed Implementation Report).	17 workshops were offered across the alliance in Fall 2021 (Source: Engagement Opportunity Log, Detailed Implementation Report).
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)	Opportunities are shared via the Canvas Shell (Source: Project Staff Interview).	Pasco Hernando did not have LSAMP members in Fall 2021.	Opportunities are shared via the Canvas Shell (Source: Project Staff Interview).	Opportunities are shared via the Canvas Shell (Source: Project Staff Interview).	Across the alliance, project staff reported opportunities were shared via the LSAMP Canvas Shell at their institution (Source: Project Staff Interview).
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					Reported beginning in Year 2.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021.

SF 7.1: Workshops on STEM careers and expanding STEM networks were offered at institutions. An average of 6 workshops were offered at each of the three institutions that had LSAMP members in Fall 2021. Workshops included webinars on Research Experiences for Undergraduates, student presentations on their STEM research experiences, career service presentations on LinkedIn and planning career back-ups, and overviews of careers in STEM.

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.

SF 7.3: This activity will begin and be reported on in Year 2.

Table 8. Student Focused Fidelity of Implementation Matrix 8: STEM Conference

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					This activity will begin and be reported in Year 2.
	Evidence STEM Summit was held.	Detailed Implementation Report; Roster of STEM Summit attendees					This activity will begin and be reported in Year 2.
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.	Students did not attend national STEM conferences in Fall 2021.	Pasco Hernando did not have LSAMP members in Fall 2021.	Students did not attend national STEM conferences in Fall 2021.	Four students attended the virtual Annual Biomedical Research Conference for Minority Students (11/10/21-11/13/21; Source: Engagement Opportunity Log).	Data were only available for one institution.
SF 8.3: LSAMP students encouraged and supported to submit applications to present	# of student meetings where students were encouraged to submit applications.	Detailed Implementation Report; Advising Log	Meetings were not held in Fall 2021.	Pasco Hernando did not have LSAMP members in Fall 2021.	Meetings were not held in Fall 2021.	Opportunities were shared via the Canvas Shell (Source: Detailed	Data were only available for one institution.

research at national STEM conferences.						Implementation Report).	
	# of student research proposals submitted to national STEM conferences	Detailed Implementation Report; List of students who attended or presented at STEM conferences.	Student research proposals were not submitted in Fall 2021.	Pasco Hernando did not have LSAMP members in Fall 2021.	Student research proposals were not submitted in Fall 2021.	Student research proposals were not submitted in Fall 2021.	Student research proposals were not submitted in Fall 2021.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021.

SF 8.1: The annual STEM Summit will be held in Spring 2022. It will be reported on in Year 2.

SF 8.2: Four Valencia students attended the 2022 Florida Undergraduate Research Conference (FURC). All students who attended rated the event as “very meaningful” on the General Event Feedback Form. Students reported networking with others and seeing the research was the biggest benefit of attending the conference.

SF 8.3: Valencia shared information on conference proposal opportunities through their Canvas shell. Although this did not result in student research proposals being submitted, Valencia staff reported that they plan to sponsor two students and a staff member to attend the in-person Emerging Researchers National Conference in Washington, DC.

Table 9. Student Focused Fidelity of Implementation Matrix 9: College and Industry Tours

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					This activity will begin and be reported in Year 2.
	# of students who attend in-person and virtual lab tours	Detailed Implementation Report; Rosters from in-person and virtual lab tours					This activity will begin and be reported in Year 2.
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	One lab tour was taken to the MOTE Marine Laboratory/Aquarium in Sarasota, FL (Source: Engagement Opportunity Log, Detailed Implementation Report).	Pasco Hernando did not have LSAMP members in Fall 2021.	Lab Tours were not offered in Fall 2021.	Lab Tours were not offered in Fall 2021.	Data were only available for one institution.
	# of students who attend in-person and virtual STEM industry tours	Detailed Implementation Report; Rosters from in-person and virtual STEM industry tours	12 students attended the University of Florida College Tour (Source: Engagement Opportunity Log, Detailed Implementation Report).	Pasco Hernando did not have LSAMP members in Fall 2021.	Lab Tours were not offered in Fall 2021.	Lab Tours were not offered in Fall 2021.	Data were only available for one institution.
SF 9.3: Students attend college tours at university partners' institutions.	# of college tours offered	Detailed Implementation Report; List of college and industry tours	College tours were not offered in Fall 2021.	Pasco Hernando did not have LSAMP members in Fall 2021.	College Tours were not offered in Fall 2021.	One college tour was taken to the University of Florida (Source: Engagement Opportunity Log, Detailed	Data were only available for one institution.

						Implementation Report).	
	# of students who attend college tours	Detailed Implementation Report; Rosters from college tours	College tours were not offered in Fall 2021.	Pasco Hernando did not have LSAMP members in Fall 2021.	College Tours were not offered in Fall 2021.	7 students attended the University of Florida College Tour (Source: Engagement Opportunity Log, Detailed Implementation Report).	Data were only available for one institution.
SF 9.4: Students are satisfied with tours.	% of students satisfied with tours	Detailed Implementation Report; Event Feedback Form		Pasco Hernando did not have LSAMP members in Fall 2021.			This will be reported in Year 2.

Note: Pasco-Hernando is not included in the following descriptions as they did not have LSAMP members in Fall 2021. The College of Central Florida and Polk State are not included in the descriptions for 9.3 and 9.4 as they did not hold tours in Fall 2021.

SF 9.1: Institutions did not hold lab tours in Fall 2021. This activity will begin and be reported in Year 2.

SF 9.2: The College of Central Florida was able to offer one STEM industry tour to the MOTE Marine Lab/Aquarium in Sarasota, Florida. Twelve students attended the tour.

SF 9.3: Valencia was able to offer one college tour to the University of Florida. This tour was hosted by programs in the College of Agricultural and Life Sciences. Seven students attended the tour.

SF 9.4: Although Valencia held a college tour to the University of Florida, the feedback form was not in place at that time. Data will be reported in Year 2.

Table 10. Student Focused Fidelity of Implementation Matrix 10: LSAMP Research Scholars

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.

SF 10.1-10.4: This activity requires students to be a LSAMP member for a full semester prior to applying. LSAMP Research Scholars will begin in Spring 2022 and will be reported on in Year 2.

Table 11. Student Focused Fidelity of Implementation Matrix 11: LSAMP Community Interns

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.
SF 11.3: Community Interns present internship experiences as artifacts.	% of Community Interns who develop artifacts	Detailed Implementation Report; STEM Professionalization Experience Log					This activity will begin and be reported in Year 2.

SF 11.1-11.3: This activity requires students to be a LSAMP member for a full semester prior to applying. Community Interns will begin in Spring 2022 and will be reported on in Year 2.

Table 12. Student Focused Fidelity of Implementation Matrix 12: LSAMP Peer Coaches

Activity	Indicator	Data Source	College of Central Florida Status	Pasco-Hernando Status	Polk State Status	Valencia 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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.
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					This activity will begin and be reported in Year 2.

SF 12.1-12.4: This activity requires students to be a LSAMP member for a full semester prior to applying. Peer coaches will begin in Spring 2022 and will be reported on in Year 2.

Faculty Focused Fidelity

Table 13. Faculty Focused Fidelity of Implementation Matrix 1: Faculty Development

Activity	Indicator	Data Source	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	0 workshops offered in Fall 2021	0 workshops offered in Fall 2021	0 workshops offered in Fall 2021	0 workshops offered in Fall 2021	Workshops were not offered to faculty in Fall 2021
	# of faculty who participate in workshops	Detailed Implementation Report; Roster of attendees	0 faculty members participated in workshops in Fall 2021	0 faculty members participated in workshops in Fall 2021	0 faculty members participated in workshops in Fall 2021	0 faculty members participated in workshops in Fall 2021	Workshops were not offered to faculty in Fall 2021

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 Fall 2021. Due to challenges of starting the new grant (e.g., recruitment, staffing), student focused activities were the priority.

Table 14. Faculty Focused Fidelity of Implementation Matrix 2: Faculty Involvement in Co-curricular Activities

Activity	Indicator	Data Source	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					This activity will begin and be reported in Year 2.
	% of faculty serving as research mentors	Detailed Implementation Report; Faculty participation log					This activity will begin and be reported in Year 2.
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	10 (potentially duplicated) faculty/staff members participated in activities in Fall 2021 (Source: Engagement Opportunity Log).	Pasco Hernando did not have LSAMP members or activities in Fall 2021.	63 (potentially duplicated) faculty/staff members participated in activities in Fall 2021 (Source: Engagement Opportunity Log).	35 (potentially duplicated) faculty/staff members participated in activities in Fall 2021 (Source: Engagement Opportunity Log).	108 (potentially duplicated) faculty/staff members across the alliance participated in activities in Fall 2021 (Source: Engagement Opportunity Log).

FF 2.1: Faculty research mentors are part of the LSAMP Research Scholars program. To be an LSAMP Research Scholar, students must be a LSAMP member for one semester. Students are not eligible for this program until Spring 2022. Faculty research mentors will be reported in Year 2.

FF 2.2: Faculty and staff members were involved in LSAMP activities in Fall 2021. Numbers of potentially duplicated faculty and staff members are presented in the table above.

Table 15. Faculty Focused Fidelity of Implementation Matrix 3: Faculty Participation in CFSA Work Groups and Implementation Teams

Activity	Indicator	Data Source	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					This indicator will be reported in Year 2.
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					This indicator will be reported in Year 2.

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. However, the work groups were not convened in Fall 2021. Work groups are scheduled to begin meeting in March 2022.

FF 3.2: During project staff interviews, it became clear that institution-specific implementation teams were occurring, even if the process was not formalized. Institutions met on a regular basis with necessary faculty/staff to discuss implementation.

Table 16. Faculty Focused Fidelity of Implementation Matrix 3: Faculty Advocacy and Peer Community

Activity	Indicator	Data Source	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					0 opportunities offered in Fall 2021
	% of faculty who participate in cross-institution programming	Detailed Implementation Report; Roster of attendees	0 faculty members participated in programming in Fall 2021	0 faculty members participated in programming in Fall 2021	0 faculty members participated in programming in Fall 2021	0 faculty members participated in programming in Fall 2021	Programming was not offered to faculty in Fall 2021

FF 4.1: The alliance did not offer any opportunities for faculty across institutions to connect. As previously mentioned, challenges related to starting the new grant (e.g., recruitment, staffing) necessitated prioritizing student focused activities.

Department/Institution Focused Fidelity

Table 17. Department/Institution Focused Fidelity of Implementation Matrix 1: STEM Articulation and Data Sharing

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 Fall 2021
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 Fall 2021
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 Fall 2021

DIF 1.1-1.3: The alliance did not expend time on developing articulation agreements, STEM degree pathways, or data sharing agreements in Fall 2021. As previously noted, challenges with staffing resulted in a need to focus on student implementation in the first term.

Table 18. Department/Institution Focused Fidelity of Implementation Matrix 2: Data Taskforce

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 via email in Fall 2021.

DIF 1.1-1.3: 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 were serving on the Assessment and Evaluation group in addition to their other responsibilities. As previously noted, the focus needed to be on student-focused activities (e.g., establishing STEM Clubs, recruiting LSAMP members, holding LSAMP activities). The Assessment and Evaluation group will be able to meet regularly beginning in Year 2 to set indicator thresholds, review incoming data, and ensure data are shared with institutions in a timely manner.

Appendix C: Student Survey Data

Demographics

Table 19. Participants, by Institution

Institution	Frequency	Percent
College of Central Florida	4	13.8%
Polk State College	12	41.4%
Valencia College	13	44.8%
Total	29	

Table 20. Participant Age Range

Age	Frequency	Percent
18	6	20.7%
19	9	31.0%
20	5	17.2%
21	5	17.2%
22	2	6.9%
24	1	3.4%
25	1	3.4%
Total	29	

Table 21. Participant Gender Identity

Gender	Frequency	Percent
Male	9	31.0%
Female	20	69.0%
Total	29	

Table 22. Participant Race/Ethnicity

Ethnicity	Frequency	Percent
Asian	1	3.4%
Black or African American	11	37.9%
Black or African American, Hispanic or Latino	2	6.9%
Hispanic or Latino	8	27.6%
Native Hawaiian or Other Pacific Islander, White	1	3.4%
White	5	17.2%
White, North African	1	3.4%
Total	29	

Research Self-Efficacy

Table 23. Research Self-Efficacy Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	28	22.54
Polk State	12	24.25
Valencia	12	20.33

Note: The scale is composed of six items on a 1-5 scale. The highest possible score is 30. A higher score indicates higher research self-efficacy.

Table 24. Confidence in Ability to Excel in Science Major

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	1	3.5%	0	0.0%	1	7.7%
A little confidence	1	3.5%	0	0.0%	1	7.7%
Moderate confidence	11	37.9%	4	33.3%	5	38.5%
A lot of confidence	10	34.5%	6	50.0%	2	15.4%
Complete confidence	6	20.7%	2	16.7%	4	30.8%
Total	29		12		13	

Table 25. Confidence in Ability to Pursue a Research Science Career

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	1	3.4%	0	0.0%	1	7.7%
A little confidence	1	6.9%	0	0.0%	2	15.4%
Moderate confidence	11	48.3%	6	50.0%	6	46.2%
A lot of confidence	10	24.1%	4	33.3%	2	15.4%
Complete confidence	6	17.2%	2	16.7%	2	15.4%
Total	29		12		13	

Table 26. Confidence in Ability to Complete a Science Degree

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	2	7.1%	0	0.0%	2	16.7%
A little confidence	0	0.0%	0	0.0%	0	0.0%
Moderate confidence	7	25.0%	3	25.0%	3	25.0%
A lot of confidence	9	32.1%	5	41.7%	4	33.3%
Complete confidence	10	35.7%	4	33.3%	3	25.0%
Total	28		12		12	

Table 27. Confidence to Persist with Science Courses

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	0	0.0%	0	0.0%	0	0.0%
A little confidence	6	20.7%	0	0.0%	5	38.5%
Moderate confidence	3	10.3%	2	16.7%	0	0.0%
A lot of confidence	4	13.8%	1	8.3%	3	23.1%
Complete confidence	16	55.2%	9	75.0%	5	38.5%
Total	29		12		13	

Table 28. Confidence to Pursue to a Graduate Degree in Science

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	1	3.4%	0	0.0%	1	7.7%
A little confidence	5	17.2%	0	0.0%	5	38.5%
Moderate confidence	7	24.1%	4	33.3%	2	15.4%
A lot of confidence	5	17.2%	2	16.7%	2	15.4%
Complete confidence	11	37.9%	6	50.0%	3	23.1%
Total	29		12		13	

Table 29. Confidence to Complete a Graduate Degree in Science

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
No confidence	2	6.9%	0	0.0%	2	15.4%
A little confidence	4	13.8%	0	0.0%	4	30.8%
Moderate confidence	8	27.6%	5	41.7%	2	15.4%
A lot of confidence	6	20.7%	3	25.0%	2	15.4%
Complete confidence	9	31.0%	4	33.3%	3	23.1%
Total	29		12		13	

Previous STEM Research Experience

Table 30. Participation in a STEM Research Experience Previously

	Frequency	Percent
Yes	6	20.7%
No	23	79.3%
Total	29	

Table 31. Participant in a STEM Research Experience Through LSAMP Institution

	Frequency	Percent
Yes	6	100%
Total	6	

Table 32. Sources of Self-Efficacy Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	6	39.33

Note: The scale is composed of ten items on a 1-5 scale. The highest possible score is 50. Data by institution is not presented due to the small number of students for whom this scale was applicable. A higher score indicates positive sources of self-efficacy.

Table 33. Participant's Ability to Independently Conduct Experiments or Research Projects

Ability Level	Frequency	Percent
Not well at all	0	0.0%
Somewhat well	0	0.0%
Moderately well	3	50.0%
Very well	2	33.3%
Extremely well	1	16.7%
Total	6	

Table 34. Participant's Ability to Analyze Research Data

Ability Level	Frequency	Percent
Not well at all	0	0.0%
Somewhat well	0	0.0%
Moderately well	2	33.3%
Very well	4	66.7%
Extremely well	0	0.0%
Total	6	

Table 35. Participant's Ability to Write a Scientific Report

Ability Level	Frequency	Percent
Not well at all	0	0.0%
Somewhat well	0	0.0%
Moderately well	4	67%
Very well	1	17%
Extremely well	1	17%
Total	6	

Table 36. Participant's Ability to Prepare a Scientific Poster or Presentation

Ability Level	Frequency	Percent
Not well at all	0	0.0%
Somewhat well	0	0.0%
Moderately well	0	0.0%
Very well	6	100%
Extremely well	0	0.0%
Total	6	

Table 37. Primary Research Mentor Showed Participant How to Conduct a Research Procedure

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	0	0.0%
Neither agree nor disagree	0	0.0%
Agree	4	66.7%
Strongly agree	2	33.3%
Total	6	

Table 38. Feel Research Mentor is a Career Role Model

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	0	0.0%
Neither agree nor disagree	1	16.7%
Agree	4	66.7%
Strongly agree	1	16.7%
Total	6	

Table 39. Research Mentor Encouraged a Research Science Career

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	0	0.0%
Neither agree nor disagree	0	0.0%
Agree	4	66.7%
Strongly agree	2	33.3%
Total	6	

Table 40. Research Mentor Told Participant They Have the Ability to be a Scientist

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	0	0.0%
Neither agree nor disagree	0	0.0%
Agree	4	66.7%
Strongly agree	2	33.3%
Total	6	

Table 41. Participant Felt Nervous When Conducting Research

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	1	16.7%
Neither agree nor disagree	0	0.0%
Agree	4	66.7%
Strongly agree	1	16.7%
Total	6	

Table 42. Participant Felt Anxious About Ability to do Research

Agreement Level	Frequency	Percent
Strongly disagree	0	0.0%
Disagree	1	16.7%
Neither agree nor disagree	0	0.0%
Agree	5	83.3%
Strongly agree	0	0.0%
Total	6	

Research Science Career

Table 43. Outcome Expectations Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	29	18.00
Polk State	12	17.83
Valencia	13	18.54

Note: The scale is composed of four items on a 1-5 scale. The highest possible score is 20. A higher score indicates higher outcome expectations.

Table 44. A research science career can make a difference in society

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	1	3.4%	0	0.0%	1	7.7%
Agree	10	34.5%	4	33.3%	4	30.8%
Strongly agree	18	62.1%	8	66.7%	8	61.5%
Total	29		12		13	

Table 45. Research science allows me to do work I find satisfying

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	1	3.4%	0	0.0%	1	7.7%
Agree	11	37.9%	6	50.0%	3	23.1%
Strongly agree	17	58.6%	6	50.0%	9	69.2%
Total	29		12		13	

Table 46. Research science allows me to go into a field with high employment demand

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	3	10.3%	1	8.3%	1	7.7%
Agree	10	34.5%	5	41.7%	3	23.1%
Strongly agree	16	55.2%	6	50.0%	9	69.2%
Total	29		12		13	

Table 47. A research science career would allow me to earn an attractive salary

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	4	13.8%	2	16.7%	1	7.7%
Agree	9	31.0%	5	41.7%	1	7.7%
Strongly agree	16	55.2%	5	41.7%	11	84.6%
Total	29		12		13	

Science Identity

Table 48. Science Identity Scale, Average

Institution	Number of Students with Complete Response	Average
All institutions	16	10.63
Polk State	5	11.20
Valencia	8	10.25

Note: The scale is composed of three items on a 1-5 scale. The highest possible score is 15. A higher score indicates higher science identity.

Table 49. Participants' most recent research experience allowed them to feel like a scientist

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	2	11.8%	1	20.0%	1	11.1%
Neither agree nor disagree	3	17.6%	1	20.0%	1	11.1%
Agree	8	47.1%	1	20.0%	6	66.7%
Strongly agree	4	23.5%	2	40.0%	1	11.1%
Total	17		5		9	

Table 50. Participants' most recent research experience allowed them to interact with scientists from outside of school

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	5.6%	1	16.7%	0	0.0%
Disagree	2	11.1%	0	0.0%	2	22.2%
Neither agree nor disagree	7	38.9%	3	50.0%	2	22.2%
Agree	6	33.3%	1	16.7%	4	44.4%
Strongly agree	2	11.1%	1	16.7%	1	11.1%
Total	18		6		9	

Table 51. Participants' most recent research experience allowed them to feel like part of the scientific community

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Disagree	3	15.8%	0	0.0%	3	30.0%
Neither agree nor disagree	5	26.3%	1	16.7%	2	20.0%
Agree	7	36.8%	2	33.3%	4	40.0%
Strongly agree	4	21.1%	3	50.0%	1	10.0%
Total	19		6		10	

Mentoring

Table 52. Mentoring Scale, Average

Institution	Number of Students with Complete Response	Average
All institutions	28	28.75
Polk State	11	31.55
Valencia	13	27.85

Note: The scale is composed of eight items on a 1-5 scale. The highest possible score is 40. A higher score indicates positive experiences with mentoring at the institution.

Table 53. Mentor provided challenging assignments that presented opportunities to learn new skills

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	3	10.7%	1	9.1%	1	7.7%
To a small extent	1	3.6%	0	0.0%	1	7.7%
To some extent	10	35.7%	2	18.2%	6	46.2%
To a large extent	10	35.7%	5	45.5%	4	30.8%
To a very large extent	4	14.3%	3	27.3%	1	7.7%
Total	28		11		13	

Table 54. Mentor helped participants meet other people in their field at their college

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.4%	0	0.0%	1	8.3%
To a small extent	0	0.0%	0	0.0%	0	0.0%
To some extent	12	44.4%	5	45.5%	6	50.0%
To a large extent	10	37.0%	4	36.4%	4	33.3%
To a very large extent	3	11.1%	2	18.2%	1	8.3%
Total	27		11		12	

Table 55. Mentor helped participant figure out for themselves how to answer a research question

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	4	14.8%	1	9.1%	2	16.7%
To a small extent	1	3.7%	0	0.0%	1	8.3%
To some extent	12	44.4%	4	36.4%	7	58.3%
To a large extent	8	29.6%	5	45.5%	2	16.7%
To a very large extent	2	7.4%	1	9.1%	0	0.0%
Total	27		11		12	

Table 56. Mentor helped participant figure out for themselves how to understand and explain their research results

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	4	14.3%	0	0.0%	3	23.1%
To a small extent	1	3.6%	1	9.1%	0	0.0%
To some extent	12	42.9%	4	36.4%	6	46.2%
To a large extent	9	32.1%	4	36.4%	4	30.8%
To a very large extent	2	7.1%	2	18.2%	0	0.0%
Total	28		11		13	

Table 57. Mentor conveyed empathy for the concerns and feelings participants discussed with them

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	5	17.9%	2	18.2%	2	15.4%
To a small extent	2	7.1%	0	0.0%	1	7.7%
To some extent	6	21.4%	1	9.1%	4	30.8%
To a large extent	11	39.3%	6	54.5%	4	30.8%
To a very large extent	4	14.3%	2	18.2%	2	15.4%
Total	28		11		13	

Table 58. Mentor provided a consistent place participants could go to for assistance or support

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	1	3.6%	1	9.1%	0	0.0%
To some extent	8	28.6%	2	18.2%	4	30.8%
To a large extent	11	39.3%	3	27.3%	7	53.8%
To a very large extent	6	21.4%	5	45.5%	1	7.7%
Total	28		11		13	

Table 59. Mentor encouraged participants to talk openly about anxiety and fears that detract from their work

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	4	14.3%	1	9.1%	2	15.4%
To a small extent	1	3.6%	1	9.1%	0	0.0%
To some extent	8	28.6%	2	18.2%	5	38.5%
To a large extent	9	32.1%	4	36.4%	4	30.8%
To a very large extent	6	21.4%	3	27.3%	2	15.4%
Total	28		11		13	

Table 60. Mentor shared personal experiences as an alternative perspective to participants' problems.

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	6	21.4%	3	27.3%	2	15.4%
To a small extent	2	7.1%	0	0.0%	2	15.4%
To some extent	13	46.4%		27.3%	8	61.5%
To a large extent	6	21.4%	4	36.4%	1	7.7%
To a very large extent	1	3.6%	1	9.1%	0	0.0%
Total	28		11		13	

Table 61. 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	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	5	17.9%	2	18.2%	2	15.4%
To a small extent	2	7.1%	1	9.1%	1	7.7%
To some extent	13	46.4%	2	18.2%	9	69.2%
To a large extent	5	17.9%	3	27.3%	1	7.7%
To a very large extent	3	10.7%	3	27.3%	0	0.0%
Total	28		11		13	

Table 62. Mentor shared the history of their career

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	3	10.7%	1	9.1%	1	7.7%
To a small extent	1	3.6%	0	0.0%	1	7.7%
To some extent	12	42.9%	4	36.4%	7	53.8%
To a large extent	9	32.1%	4	36.4%	4	30.8%
To a very large extent	3	10.7%	2	18.2%	0	0.0%
Total	28		11		13	

Table 63. Mentor encouraged participants to prepare for the next steps in their academic program and/or career

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	0	0.0%	0	0.0%	0	0.0%
To some extent	6	21.4%	1	9.1%	5	38.5%
To a large extent	7	25.0%	3	27.3%	3	23.1%
To a very large extent	13	46.4%	7	63.6%	4	30.8%
Total	28		11		13	

Table 64. Mentor listened to participants

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	0	0.0%	0	0.0%	0	0.0%
To some extent	4	14.3%	1	9.1%	3	23.1%
To a large extent	12	42.9%	3	27.3%	6	46.2%
To a very large extent	10	35.7%	7	63.6%	3	23.1%
Total	28		11		13	

Table 65. Mentor serves as a role model

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	0	0.0%	0	0.0%	0	0.0%
To some extent	4	14.3%	0	0.0%	3	23.1%
To a large extent	14	50.0%	7	63.6%	5	38.5%
To a very large extent	8	28.6%	4	36.4%	4	30.8%
Total	28		11		13	

Table 66. Mentor displayed attitudes and values similar the participant's

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	2	7.1%	1	9.1%	0	0.0%
To some extent	11	39.3%	4	36.4%	5	38.5%
To a large extent	11	39.3%	5	45.5%	6	46.2%
To a very large extent	2	7.1%	1	9.1%	1	7.7%
Total	28		11		13	

Table 67. Mentor helped the participant with a presentation

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	5	17.9%	2	18.2%	2	15.4%
To a small extent	1	3.6%	0	0.0%	0	0.0%
To some extent	13	46.4%	6	54.5%	6	46.2%
To a large extent	3	10.7%	1	9.1%	2	15.4%
To a very large extent	6	21.4%	2	18.2%	3	23.1%
Total	28		11		13	

Table 68. Mentor helped participants make an informed decision regarding career options

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	2	7.1%	0	0.0%	1	7.7%
To a small extent	3	10.7%	1	9.1%	2	15.4%
To some extent	7	25.0%	2	18.2%	4	30.8%
To a large extent	11	39.3%	6	54.5%	4	30.8%
To a very large extent	5	17.9%	2	18.2%	2	15.4%
Total	28		11		13	

Table 69. Mentor taught participants other specific research skills, or how to do a specific task

	All institutions		Polk State		Valencia	
Extent Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all	3	10.7%	0	0.0%	2	15.4%
To a small extent	1	3.6%	0	0.0%	0	0.0%
To some extent	8	28.6%	3	27.3%	4	30.8%
To a large extent	10	35.7%	4	36.4%	5	38.5%
To a very large extent	6	21.4%	4	36.4%	2	15.4%
Total	28		11		13	

Confidence as a Scientist

Table 70. Confidence as a Scientist Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	29	32.31
Polk State	12	34.85
Valencia	13	30.15

Note: The scale is composed of ten items on a 1-5 scale. The highest possible score is 50. A higher score indicates confidence as a scientist.

Table 71. Confidence in use of technical science skills

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	2	6.9%	0	0.0%	1	7.7%
To a small extent	4	13.8%	1	8.3%	3	23.1%
To some extent	9	31.0%	6	50.0%	2	15.4%
To a large extent	11	37.9%	3	25.0%	7	53.8%
Absolutely confident	3	10.3%	2	16.7%	0	0.0%
Total	29		12		13	

Table 72. Confidence in use of scientific language and terminology

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	1	3.4%	0	0.0%	1	7.7%
To a small extent	4	13.8%	1	8.3%	1	7.7%
To some extent	10	34.5%	4	33.3%	5	38.5%
To a large extent	12	41.4%	6	50.0%	5	38.5%
Absolutely confident	2	6.9%	1	8.3%	1	7.7%
Total	29		12		13	

Table 73. Confidence to generate a research question to answer

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	2	6.9%	0	0.0%	2	15.4%
To a small extent	2	6.9%	1	8.3%	0	0.0%
To some extent	14	48.3%	6	50.0%	5	38.5%
To a large extent	9	31.0%	4	33.3%	5	38.5%
Absolutely confident	2	6.9%	1	8.3%	1	7.7%
Total	29		12		13	

Table 74. Confidence to figure out what data/observations to collect and how to collect them

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	1	3.4%	0	0.0%	1	7.7%
To a small extent	5	17.2%	1	8.3%	3	23.1%
To some extent	10	34.5%	5	41.7%	3	23.1%
To a large extent	10	34.5%	4	33.3%	5	38.5%
Absolutely confident	3	10.3%	2	16.7%	1	7.7%
Total	29		12		13	

Table 75. Confidence to analyze data observations

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	2	6.9%	0	0.0%	2	15.4%
To a small extent	3	10.3%	0	0.0%	3	23.1%
To some extent	10	34.5%	5	41.7%	3	23.1%
To a large extent	8	27.6%	4	33.3%	4	30.8%
Absolutely confident	6	20.7%	3	25.0%	1	7.7%
Total	29		12		13	

Table 76. Confidence to create explanations for the results of the study

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	1	3.4%	0	0.0%	1	7.7%
To a small extent	6	20.7%	2	16.7%	4	30.8%
To some extent	12	41.4%	5	41.7%	4	30.8%
To a large extent	7	24.1%	4	33.3%	3	23.1%
Absolutely confident	3	10.3%	1	8.3%	1	7.7%
Total	29		12		13	

Table 77. Confidence of use of scientific literature to guide research

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	4	13.8%	1	8.3%	2	15.4%
To a small extent	3	10.3%	1	8.3%	2	15.4%
To some extent	10	34.5%	4	33.3%	5	38.5%
To a large extent	8	27.6%	4	33.3%	2	15.4%
Absolutely confident	4	13.8%	2	16.7%	2	15.4%
Total	29		12		13	

Table 78. Confidence to relate results and explanations to the work of others

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	2	6.9%	0	0.0%	2	15.4%
To a small extent	3	10.3%	1	8.3%	2	15.4%
To some extent	11	37.9%	6	50.0%	5	38.5%
To a large extent	8	27.6%	2	16.7%	3	23.1%
Absolutely confident	5	17.2%	3	25.0%	1	7.7%
Total	29		12		13	

Table 79. Confidence to develop theories

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	2	6.9%	0	0.0%	2	15.4%
To a small extent	9	31.0%	3	25.0%	4	30.8%
To some extent	11	37.9%	6	50.0%	4	30.8%
To a large extent	4	13.8%	1	8.3%	2	15.4%
Absolutely confident	3	10.3%	2	16.7%	1	7.7%
Total	29		12		13	

Table 80. Confidence to report results in an oral presentation or written report

	All institutions		Polk State		Valencia	
Confidence Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Not at all confident	4	13.8%	1	8.3%	3	23.1%
To a small extent	6	20.7%	3	25.0%	2	15.4%
To some extent	9	31.0%	4	33.3%	3	23.1%
To a large extent	5	17.2%	1	8.3%	4	30.8%
Absolutely confident	5	17.2%	3	25.0%	1	7.7%
Total	29		12		13	

Identity as a Scientist

Table 81. Identity as a Scientist Scale, Average Score

Institution	Number of Students with Complete Response	Average
All institutions	29	18.17
Polk State	12	18.33
Valencia	13	17.69

Note: The scale is composed of six items on a 1-5 scale. The highest possible score is 30. A higher score indicates stronger identity as a scientist.

Table 82. Being a scientist is an important part of participant self-image

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	2	6.9%	0	0.0%	2	15.4%
Disagree	2	6.9%	1	8.3%	1	7.7%
Neither agree nor disagree	13	44.8%	7	58.3%	5	38.5%
Agree	7	24.1%	3	25.0%	2	15.4%
Strongly agree	5	17.2%	1	8.3%	3	23.1%
Total	29		12		13	

Table 83. Participant possesses a strong sense of belonging to the community of scientists

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	3	10.3%	0	0.0%	2	15.4%
Disagree	5	17.2%	2	16.7%	3	23.1%
Neither agree nor disagree	10	34.5%	6	50.0%	4	30.8%
Agree	11	37.9%	4	33.3%	4	30.8%
Strongly agree	0	0.0%	0	0.0%	0	0.0%
Total	29		12		13	

Table 84. Being a scientist is an important reflection of who participant is

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	2	6.9%	0	0.0%	2	15.4%
Disagree	3	10.3%	1	8.3%	2	15.4%
Neither agree nor disagree	13	44.8%	7	58.3%	5	38.5%
Agree	8	27.6%	3	25.0%	3	23.1%
Strongly agree	3	10.3%	1	8.3%	1	7.7%
Total	29		12		13	

Table 85. Participant has come to think of themselves as a "scientist"

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	2	6.9%	0	0.0%	2	15.4%
Disagree	11	37.9%	6	50.0%	2	15.4%
Neither agree nor disagree	8	27.6%	4	33.3%	4	30.8%
Agree	6	20.7%	2	16.7%	3	23.1%
Strongly agree	2	6.9%	0	0.0%	2	15.4%
Total	29		12		13	

Table 86. Participant is a scientist

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	7	24.1%	3	25.0%	4	30.8%
Disagree	6	20.7%	2	16.7%	2	15.4%
Neither agree nor disagree	9	31.0%	5	41.7%	3	23.1%
Agree	4	13.8%	2	16.7%	1	7.7%
Strongly agree	3	10.3%	0	0.0%	3	23.1%
Total	29		12		13	

Table 87. Participant social network includes a lot of scientists and/or science students

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	6	20.7%	1	8.3%	4	30.8%
Disagree	3	10.3%	1	8.3%	1	7.7%
Neither agree nor disagree	7	24.1%	4	33.3%	2	15.4%
Agree	9	31.0%	5	41.7%	4	30.8%
Strongly agree	4	13.8%	1	8.3%	2	15.4%
Total	29		12		13	

Commitment to Science

Table 88. Participant intends to work in a job related to science

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	0	0.0%	0	0.0%	0	0.0%
Somewhat disagree	1	3.4%	0	0.0%	1	7.7%
Neither agree nor disagree	5	17.2%	2	16.7%	3	23.1%
Somewhat agree	6	20.7%	3	25.0%	3	23.1%
Strongly agree	17	58.6%	7	58.3%	6	46.2%
Total	29		12		13	

Table 89. Participant sees the next steps in the field of science and intends to take them

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	1	3.4%	0	0.0%	1	7.7%
Neither agree nor disagree	6	20.7%	3	25.0%	3	23.1%
Somewhat agree	10	34.5%	4	33.3%	5	38.5%
Strongly agree	11	37.9%	5	41.7%	3	23.1%
Total	29		12		13	

Table 90. Participant will work as hard as necessary to achieve a career in science

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	5	17.2%	2	16.7%	3	23.1%
Somewhat agree	7	24.1%	3	25.0%	4	30.8%
Strongly agree	16	55.2%	7	58.3%	5	38.5%
Total	29		12		13	

Table 91. Participant expects a career in this field will be very satisfying

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	0	0.0%	0	0.0%	0	0.0%
Neither agree nor disagree	7	24.1%	2	16.7%	5	38.5%
Somewhat agree	10	34.5%	5	41.7%	4	30.8%
Strongly agree	11	37.9%	5	41.7%	3	23.1%
Total	29		12		13	

Table 92. Participant feels they are on a definite career path in science

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	1	3.4%	0	0.0%	1	7.7%
Neither agree nor disagree	10	34.5%	4	33.3%	5	38.5%
Somewhat agree	7	24.1%	4	33.3%	2	15.4%
Strongly agree	10	34.5%	4	33.3%	4	30.8%
Total	29		12		13	

Table 93. Participant definitely wants a career for themselves in science

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	1	3.4%	0	0.0%	1	7.7%
Neither agree nor disagree	4	13.8%	2	16.7%	2	15.4%
Somewhat agree	10	34.5%	4	33.3%	5	38.5%
Strongly agree	13	44.8%	6	50.0%	4	30.8%
Total	29		12		13	

Table 94. Science is the ideal field of study for the participants' life

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	1	3.4%	0	0.0%	1	7.7%
Somewhat disagree	1	3.4%	0	0.0%	1	7.7%
Neither agree nor disagree	7	24.1%	3	25.0%	4	30.8%
Somewhat agree	11	37.9%	5	41.7%	6	46.2%
Strongly agree	9	31.0%	4	33.3%	1	7.7%
Total	29		12		13	

Collegiate Status

Table 95. School attended during the last academic year

School	Frequency	Percent
High school	10	35.7%
Junior or Community College	14	50.0%
4-year College or University	3	10.7%
Was not in school	1	3.6%
Total	28	

Table 96. Year in college participant is entering in Fall 2022

Year	Frequency	Percent
1st	1	3.6%
2nd	14	50.0%
3rd	8	28.6%
4th	5	17.9%
Total	28	

Table 97. Current enrollment in a 4-year college

Enrollment	Frequency	Percent
Enrolled	7	25.0%
Not enrolled	21	75.0%
Total	28	

Table 98. Declaration of a science or engineering major, past or present

Declaration	Frequency	Percent
Declared a science or engineering major	20	71.4%
Not declared a science or engineering major	8	28.6%
Total	28	

Table 99. Current science or engineering major status

Major status	Frequency	Percent
Currently a science or engineering major	24	85.7%
Not currently a science or engineering major	4	14.3%
Total	28	

Table 100. Plans to graduate as science or engineering major

Graduation status	Frequency	Percent
Planning to graduate as a science or engineering major	25	89.3%
Not planning to graduate as a science or engineering major	3	10.7%
Total	28	

Post-Graduation

Table 101. Post-graduation plans (*n*=28)

Potential degrees	Frequency	Percent across participants
Doctor of Medicine (MD) /Doctor of Osteopathic Medicine (DO)	4	14.3%
Don't know	9	32.1%
No advanced degree	2	7.1%
Other advanced degree (Please specify)	10	35.7%
Other health-related degree (Please specify)	2	7.1%
Ph.D. in STEM	6	21.4%
Science Teaching Credential for K-12 education	1	3.6%
Total	34	

Table 102. Degrees specified by participants

Other health-related degree
Nursing/Nurse Practitioner
Doctor of Pharmacy (Pharm. D)
Other advanced degree
Bachelor's in science
Biology
Computer Science
Doctor of Veterinary Medicine (DVM)
Geomatics
Graphic Design
Law Degree
M.E/E.C Electrical Engineer
Master's Degree in Zoology

Table 103. Careers participants report considering after graduation (n=28)

Potential degrees	Frequency	Percent across participants
Don't know	3	10.7%
Engineering research (or research plus teaching)	5	17.9%
Industry position for engineering	4	14.3%
Industry position for science	7	25.0%
Industry position for technology	4	14.3%
Mathematics research (or research plus teaching)	1	3.6%
Medical practice	7	25.0%
Medical research (or research plus teaching)	7	25.0%
Other career (Please specify)	7	25.0%
Science research (or research plus teaching)	10	35.7%
Teaching science (e.g., K-12 education, community college, four-year college or university)	3	10.7%
Technology research (or research plus teaching)	4	14.3%
Total	62	

Table 104. Careers specified by participants

Other career
Computer Science
Environmental lawyer
Forensics and biochemistry
Graphic Design
Pilot (Aviation)
Veterinarian
Zoology (Animal) research

Impact of Background

Table 105. Prior to enrolling in college, participant had personal contact with one or more scientists of the same ethnicity as them

Agreement Level	All institutions		Polk State		Valencia	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	15	53.6%	8	66.7%	7	58.3%
Somewhat disagree	2	7.1%	0	0.0%	0	0.0%
Neither agree nor disagree	6	21.4%	2	16.7%	3	25.0%
Somewhat agree	4	14.3%	2	16.7%	2	16.7%
Strongly agree	1	3.6%	0	0.0%	0	0.0%
Total	28		12		12	

Table 106. Prior to enrolling in college, participant had personal contact with one or more scientists of the same gender as them

Agreement Level	All institutions		Polk State		Valencia	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	13	46.4%	6	50.0%	6	50.0%
Somewhat disagree	1	3.6%	0	0.0%	0	0.0%
Neither agree nor disagree	4	14.3%	2	16.7%	2	16.7%
Somewhat agree	5	17.9%	2	16.7%	3	25.0%
Strongly agree	5	17.9%	2	16.7%	1	8.3%
Total	28		12		12	

Table 107. While in college, participant had personal contact with one or more scientists of the same ethnicity as them

Agreement Level	All institutions		Polk State		Valencia	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	11	39.3%	4	33.3%	6	50.0%
Somewhat disagree	3	10.7%	3	25.0%	0	0.0%
Neither agree nor disagree	7	25.0%	3	25.0%	4	33.3%
Somewhat agree	6	21.4%	2	16.7%	2	16.7%
Strongly agree	1	3.6%	0	0.0%	0	0.0%
Total	28		12		12	

Table 108. While in college, participant had personal contact with one or more scientists of the same gender as them

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	5	17.9%	1	8.3%	4	33.3%
Somewhat disagree	5	17.9%	2	16.7%	2	16.7%
Neither agree nor disagree	4	14.3%	2	16.7%	2	16.7%
Somewhat agree	8	28.6%	3	25.0%	3	25.0%
Strongly agree	6	21.4%	4	33.3%	1	8.3%
Total	28		12		12	

Table 109. While in college, participant had one or more mentors of the same background as them

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	7	25.0%	3	25.0%	3	25.0%
Somewhat disagree	1	3.6%	0	0.0%	0	0.0%
Neither agree nor disagree	10	35.7%	6	50.0%	3	25.0%
Somewhat agree	8	28.6%	3	25.0%	4	33.3%
Strongly agree	2	7.1%	0	0.0%	2	16.7%
Total	28		12		12	

Table 110. 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	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	5	17.9%	0	0.0%	3	25.0%
Somewhat disagree	1	3.6%	0	0.0%	1	8.3%
Neither agree nor disagree	9	32.1%	4	33.3%	4	33.3%
Somewhat agree	9	32.1%	5	41.7%	3	25.0%
Strongly agree	4	14.3%	3	25.0%	1	8.3%
Total	28		12		12	

Table 111. 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	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	4	14.3%	1	8.3%	3	25.0%
Somewhat disagree	7	25.0%	1	8.3%	3	25.0%
Neither agree nor disagree	7	25.0%	4	33.3%	3	25.0%
Somewhat agree	9	32.1%	5	41.7%	3	25.0%
Strongly agree	1	3.6%	1	8.3%	0	0.0%
Total	28		12		12	

Table 112. 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	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	4	14.3%	2	16.7%	2	16.7%
Somewhat disagree	7	25.0%	0	0.0%	4	33.3%
Neither agree nor disagree	8	28.6%	5	41.7%	3	25.0%
Somewhat agree	8	28.6%	4	33.3%	3	25.0%
Strongly agree	1	3.6%	1	8.3%	0	0.0%
Total	28		12		12	

Table 113. Participant self-perception as a scientist is compatible with other aspects of their background

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	2	7.1%	0	0.0%	1	8.3%
Somewhat disagree	1	3.6%	0	0.0%	1	8.3%
Neither agree nor disagree	12	42.9%	5	41.7%	6	50.0%
Somewhat agree	12	42.9%	6	50.0%	4	33.3%
Strongly agree	1	3.6%	1	8.3%	0	0.0%
Total	28		12		12	

Table 114. Having more people with the participant's background in their field makes them feel more like a scientist

	All institutions		Polk State		Valencia	
Agreement Level	Frequency	Percent	Frequency	Percent	Frequency	Percent
Strongly disagree	4	14.3%	1	8.3%	1	8.3%
Somewhat disagree	3	10.7%	1	8.3%	2	16.7%
Neither agree nor disagree	6	21.4%	1	8.3%	4	33.3%
Somewhat agree	12	42.9%	7	58.3%	5	41.7%
Strongly agree	3	10.7%	2	16.7%	0	0.0%
Total	28		12		12	