Central Florida STEM Alliance Paths to Engagement

Final Report
July 2024

Louis Stokes Alliances for Minority Participation Bridge to Baccalaureate:

Central Florida STEM Alliance Paths to Engagement

Final Report

HRD #2110071

Report prepared by Shaffer Evaluation Group

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Executive Summary

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths) was supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to the Baccalaureate (B2B) funding from the National Science Foundation (NSF). The partner institutions that comprised the Central Florida STEM Alliance are Valencia College, Polk State College, the College of Central Florida, and Pasco-Hernando State College. Below is a summary of findings from the grant term (August 2021–June 2024). The alliance commissioned Shaffer Evaluation Group to evaluate the project across the 3-year grant term funding period.

Student-Focused Activities

- By the end of Fall 2023, the alliance successfully recruited 202 LSAMP Scholars across four institutions, an increase of 103 students from Year 1.
- Of the LSAMP Scholars recruited each year, the majority identified as Black (29%) or Hispanic (43%).
- Across the alliance, over 456 activities were hosted throughout the time period of the grant (August 2021-June 2024).
- STEM Summit was held annually each spring. Overall, 169 students (potentially duplicated) attended a STEM Summit.
- Overall, 83 students (potentially duplicated) across the alliance participated as Research Scholars, Community Interns, or Peer Coaches. The Research Scholar opportunity was most prevalent, with 54 students participating throughout the grant.

Faculty and Department/Institution-Focused Activities

- Faculty were involved 959 times in student-focused LSAMP activities across the alliance. Institution faculty and staff were involved in many ways including as advisors, research mentors, and guest speakers.
- CFSA workgroups, comprised of faculty and staff members from all institutions, met at least quarterly throughout the grant. Workgroups established deliverables to be completed by the end of each academic year.
- Each alliance institution held regular implementation team meetings with various staff members. Advisors across the partner institutions met monthly to collaborate. The Co-PIs, evaluator, and grant manager engaged in monthly conversations.
- The CFSA Governing Board was formed in Spring 2022. The presidents of all four participating colleges attended governing board meetings, which convened every six months.

Strategic Indicators

- There was an 11.6 percentage point increase in LSAMP URMs declaring a STEM major. In Fall 2022, 9.2% of LSAMP URMs (*n*=14) were STEM majors. This increased to 20.8% of LSAMP URMs (*n*=10) by Fall 2023.

- Although lower than the Year 1 baseline (80.2%), 34 of 48 LSAMP URM students (70.8%) held a GPA of 2.75 or higher demonstrating a slight increase from the prior year (68.8%).

- Of the 132 LSAMP URM students who responded to the measure regarding motivation in STEM in the baseline survey, 112 (84.8%) indicated they planned to graduate as science or engineering majors.

- Overall, 1,909 URM students transferred to university partner institutions. In the final year of the grant, 635 URM students transferred, demonstrating an increase over the baseline established in the prior grant (451).

- Compared to the beginning of the grant, LSAMP URM students demonstrated increased retention and persistence compared to their Non-URM peers. In Fall 2023, 56.7% of URM students were retained, while only 43.8% of non-URM students were retained. In Fall 2023, 55.2% of LSAMP URM students persisted, while only 50% of non-URM students persisted.

- There was a slight increase in the participation rate in CFSA activities for students. Fall 2021 participation was compared to Fall 2023 participation. In Fall 2021, 35% of students participated in 3 or more activities. In Fall 2023, 36% of students participated in 3 or more activities.

- The alliance sought to increase the graduation rates of LSAMP URM students. This target was not met by the end of the grant; there was a slight decrease in LSAMP URM student graduation rates of 0.4% of students.

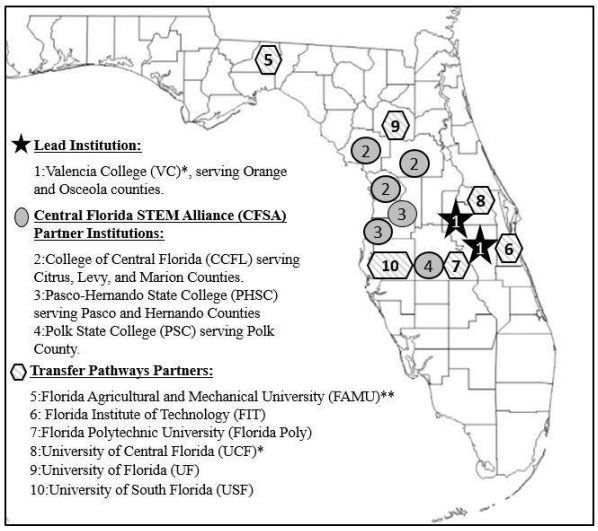
- Students reported they felt they belonged in STEM at their institution as evidenced by increases to the average scale scores on the Science Identity Scale and Identity as a Scientist Scale.

- There was some evidence of increased STEM self-efficacy and identity, as evidenced by increases to the average scale scores on the research self-efficacy sale, confidence as a scientist scale, and commitment to science scale. Although there was a slight decrease on the sources of self-efficacy scale, the average score indicates on average students are in strong agreement that they performed well in their research role.

Chapter One: Background

Project Background

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths), supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to the Baccalaureate (B2B) funding from the National Science Foundation, sought to strengthen the STEM educational ecosystem in Central Florida to support historically underrepresented minority (URM) students. This ecosystem was an interconnected, intentional network striving to support STEM education and literacy and to enhance college readiness and success in STEM through engagement in proven and innovative strategies. This project leveraged the experience and success of the previously funded CFSA projects (HRD #1304966, HRD #1712683) and the comprehensive LSAMP model, while utilizing innovative, evidence-based strategies to maximize opportunities in STEM for URM community college students. The project built 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), collaborated with community college partners, including the College of Central Florida (CF), Pasco-Hernando State College (PHSC), and Polk State College (PSC).



The largest challenge across the alliance during the project was Florida Senate Bill 266, which went into effect on July 2023 and directly affected the grant, ultimately resulting in early termination of the project in June 2024.[1] During the first part of Year 3 the Alliance Director commented, *"executive leaders decided that to continue to be able to support LSAMP-eligible students under this grant, we also need to provide opportunities to students who are not eligible."* In Year 3, Valencia College began to use institution funds to support equal opportunities for students who were not eligible to participate in LSAMP. During Year 4, partner institutions adopted the same model. However, this was eventually determined not to be in alignment with legislation and the Co-PIs decided to end the project at the end of the fiscal year.

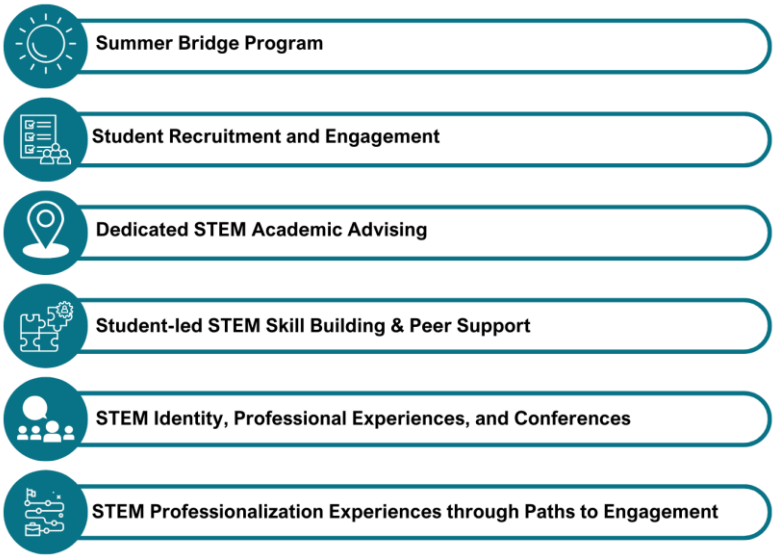
Program Design

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

[1] https://www.flsenate.gov/Session/Bill/2023/266/?Tab=BillHistory

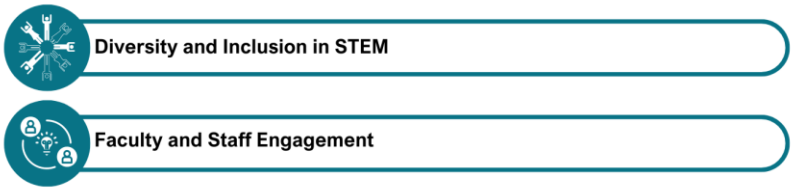
Student-Focused Activities

Student-focused activities were comprised of six primary areas. Full descriptions of each area are provided in Appendix A.



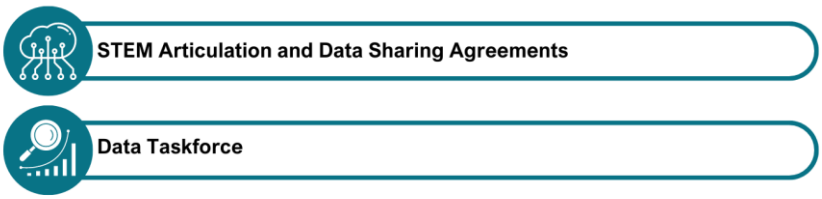
Faculty-Focused Activities

Faculty-focused activities were comprised of two primary areas. Full descriptions of each area are provided in Appendix A.



Department/Institution-Focused Activities

Department/Institution-focused activities were comprised of two primary areas. Full descriptions of each area are provided in Appendix A.



Study Design

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

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

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

Finally, the outcome/effectiveness evaluation utilized both quantitative and qualitative data to identify student, faculty, and institutional impacts from the CFSA project. It included 10 strategic indicators across two goals.

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 inSTEM 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[2] 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.
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.

[2] LSAMP Scholars are eligible to engage as a Peer Scholar only if they have previously participated as a Community Intern or Research Scholar.

Evaluation Framework

The challenges or needs this program addressed focused on building STEM[3] pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.[4] Contributing to these larger challenges were a lack of preparation, low sense of belonging, low STEM self-efficacy, lack of inclusion of community relevant components, work commitments, and lack of funding to support high-impact practices at two-year institutions. The program employed community relevant STEM learning, experiential learning, partnerships to address student needs, and programming to build STEM self-efficacy, STEM identity, and sense of belonging with the aim of increasing student transfer rates to four-year baccalaureate degree programs and increasing their success as STEM students at four-year institutions. The theory of change for the CFSA Paths to Engagement program is presented in Appendix A.

The evaluation framework was based on this theory of change and provided 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 used a mixed methods approach to fully understand the implementation context and triangulate data. The evaluation study was guided by three types of evaluation questions: fidelity of implementation, process monitoring, and outcomes. The full evaluation plan is presented in Appendix A.

Data Sources

During the grant term, data was collected to measure the extent to which the goals and associated indicators were being met or were on track to be achieved. This provided the CFSA with the information needed to adjust strategy or redeploy resources to accomplish their goals. Data sources available for the final report included qualitative data from site visits, institutional research data (e.g., GPA, persistence, retention), student survey data (i.e., baseline, annual, pulse), student feedback form data, and implementation data from each of the partner institutions. A description of each of the available data sources follows.

Site Visit Data

The evaluator conducted a virtual site visit at each CFSA institution in Spring 2022 and Spring 2024. In Spring 2023, the evaluator conducted in-person site visits at each institution. Site visit components included a student focus group, a faculty/staff focus group, and a project staff interview.

[3] "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.

[4] Historically underrepresented minority students are defined as Black or African American, Hispanic or Latino, American Indian or Alaska Native, Native Hawaiian or Pacific Islander students.

Baseline Student Survey

The Baseline Student Survey collected data on STEM self-efficacy, mentoring, STEM identity, and science education plans. The Baseline Student Survey was initially administered in Year 1 to LSAMP students between February and March 2022. After the initial administration, the survey was continuously administered as students joined LSAMP. In total there were 195 responses: 29 responses in Year 1, 84 responses in Year 2, and 82 responses in Year 3.

Annual Student Survey

The Annual Student Survey collected data on STEM self-efficacy, mentoring, STEM identity, and science education plans. The Annual Student Survey was administered each January to all LSAMP Scholars. The survey was left open for an additional two months to garner additional responses. In total there were 27 responses: 11 responses in Year 2 and 16 responses in Year 3.

Pulse Student Survey

The Pulse Student Survey collected program feedback. The Pulse Student Survey was administered each January. The survey was left open for an additional few months to garner additional responses each time. Student response to this survey was low. In total there were 36 responses: 14 responses in Year 2 and 22 responses in Year 3.

Summer Bridge Feedback Form

The Summer Bridge Feedback Form was administered each summer following student attendance of the Summer Bridge program and was left open for another month to allow for additional responses. In total there were 29 responses: 13 responses in Year 2 and 16 responses in Year 3.

General Event Feedback Form

Students were asked to complete this form at the end of any LSAMP event, starting in Year 2. Table 1 presents the number of responses received each year by institution.

Table 1. General Event Feedback Form Responses per Year, by Institution

Institution	Year 2 (Spring 2022-Fall 2022)	Year 3 (Spring 2023-Spring 2024)	Total
College of Central Florida	10	10	20
Polk State College	36	57	93
Pasco-Hernando State College	8	37	45
Valencia College	67	69	136
Total	**121**	**173**	**294**

Implementation Data

From August 2021 to June 2024, the partner institutions were expected to submit implementation data for each term. Data sources included an advising log, engagement opportunity log, faculty log, student activity log, STEM professionalization log, and detailed implementation log.

Institutional Research Data

Partner institutions were also asked to submit data from their Institutional Research office for each LSAMP Scholar. The data file requested gender, race/ethnicity, major, GPA, graduation status, a persistence indicator, and a retention indicator.

Chapter Two: Individual LSAMP Partner Findings

College of Central Florida

Summary of Student-Focused Activities

The College of Central Florida (CF), which is comprised of five campuses, was the third institution to join the LSAMP Alliance right before the pandemic. As such, its progress was limited in comparison to the other partners. During the time period of the grant, the college implemented the majority of the project components. An overview of the progress with each student-focused activity is presented below. Department/institution activities and faculty activities are presented in the next chapter.

Summer Bridge. A hybrid Summer STEM Institute (SSI) was held by Valencia College for the alliance in Summer 2022; one participant from CF attended. The College of Central Florida planned to offer a SSI in Summer 2023, but no students signed up to participate. There was an error where a faulty list was generated for recruitment. This error resulted in no students participating in SSI at CF; however, CF staff assisted Valencia in facilitating their SSI.

Appropriate Math Course Placement. Although one student was eligible for a math waiver after attending SSI in Summer 2022, the student did not utilize the waiver.

Student Recruitment and Engagement. LSAMP membership increased slightly throughout grant years. In Fall 2021, CF had seven LSAMP members, which remained the same in Fall 2022. In Fall 2023 the number of students engaged grew to nine LSAMP Scholars.[5]

Dedicated STEM Academic Advising. The current institution's STEM advisor also served as the STEM Club advisor, and LSAMP faculty reported this advisor as being very intentional about reaching out to students early on once they identified as STEM majors to encourage their involvement with the STEM Club and LSAMP.

Student-led STEM Skill Building and Peer Support. Students were involved in events and event planning beginning in Year 2. In Year 2, 19 different events were led by students. In Year 3, project staff reported there were events led by students, but in general STEM-related events, speakers, and workshops were held on campus. Across grant years, students indicated satisfaction with student-led STEM events.

Research Experiences for Undergraduates. Staff reported three students had applied for Research Experiences for Undergraduates (REUs), and one student completed an REU at the Institute for Human & Machine Cognition in Year 3 (Spring 2023–Fall 2023).

STEM Conference. Students participated in national conferences, such as the Emerging Researchers National Conference in STEM. CF LSAMP Scholars also presented at the CFSA STEM Summit.

[5] Due to limited and missing data, engagement of LSAMP Scholars is unable to be reported.

College and Industry Tours. LSAMP Scholars participated in several college and industry tours across grant years. These included a college tour to the University of South Floridia and the Institute for Human & Machine Cognition.

LSAMP Research Scholars. The College of Central Florida had Research Scholars in the final year of the project; two students participated. CF did not have Research Scholars in prior years.

LSAMP Community Interns. The College of Central Florida had a Community Intern in the final year of the project. CF did not have Community Interns in prior years.

LSAMP Peer Coaches. CF did not have Peer Coaches during the grant.

Institution Successes

The College of Central Florida successfully engaged students with advising, STEM activities, and STEM conferences throughout the grant.

The STEM advising that was offered at the college was considered a success by students. During the evaluator's annual site visit, students shared the importance of the STEM Club advisors and the role they played in their experience. They further explained they could talk to them and felt like they cared about their students, noting the advisor looked at "*research opportunities for us as ways to get involved*." The role of the advisor was important for the students' experience.

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

> *The first time we presented... like, for the first time, I was like this is so worth it! Every little thing was so worth it! I belong here. These are my people. I feel at home. This is what I want to do. And it was really rewarding after everything you go through. And you wonder so many things...and if it's worth it or if you should even be there... or if it's going to work or if it's not going to work... And it definitely felt worth it and super belonging when you really get to put it out in the world and realize it was all worth it.*

In addition to conferences, students engaged in other STEM-related opportunities through the College of Central Florida's STEM Club and LSAMP. Another exciting opportunity offered to students was the partnership between LSAMP and the Phi Theta Kappa International College

Honor Society which brought the Voyage Project to campus. The Voyage Project placed a 1 to 10-billion scale model of the solar system on the college's Ocala campus.

Institution Challenges

The College of Central Florida experienced continued challenges with recruitment and, to a lesser extent, faculty recruitment.

Participant recruitment was a challenge throughout the project, often related to the difficulty of bringing LSAMP students into the program early enough in their first year.[6] While there was some progress with recruitment, including continued work by the STEM advisor to share information early, the number of participants remained similar throughout the grant.

Faculty and staff recruitment also proved to be a challenge. In Fall 2021, the college had difficulty hiring a STEM advisor. After a failed search, the college's major STEM advisor stepped in as the LSAMP advisor. In the final year of the grant, the college's STEM Club advisor left the college, and institution staff had to find a new staff member to step in. This disruption resulted in difficulty ensuring data was collected and documented correctly. In addition, faculty recruitment for STEM professionalization opportunities was difficult throughout grant years. The institution experienced success finding research opportunities with a limited number of faculty mentors, but without additional mentors they could not expand. Institution staff commented that faculty workload was already intense, which precluded their ability to serve as research mentors.

Evidence of Sustainable Effort

The NSF LSAMP grant was instrumental in establishing a STEM club and reintroducing undergraduate research at the College of Central Florida, significantly enhancing opportunities for their students. Due to the program's success, the college was exploring ways to sustain these initiatives beyond the grant period at the time of this report. Project staff noted the grant had not only enabled impactful student research but also fostered collaboration across departments and with community organizations, allowing their students to present their work at national conferences.

[6] As a community college, the College of Central Florida primarily offers two-year degrees, with some select four-year degree programs. Considering many students may only attend for two years, it is important to engage students early in their degree program.

Pasco-Hernando State College

Summary of Student-Focused Activities

Pasco-Hernando State College (PHSC) was the newest institution to the alliance and began working with LSAMP in Fall 2021. During the time period of the grant, the college implemented the majority of project components. An overview of the progress of each student-focused activity is presented below. Department/institution activities and faculty activities are presented in the next chapter.

Summer Bridge. Three participants from PHSC attended the hybrid Summer STEM Institute (SSI) was held by Valencia College for the alliance in Summer 2022. In Summer 2023 PHSC employed a hybrid model for their own SSI in which eight students participated.

Appropriate Math Course Placement. PHSC was unable to offer math waivers for students due to cost. Math waivers were funded by institutions, if possible.

Student Recruitment and Engagement. PHSC recruited students for the first time in Summer 2022. By the end of Fall 2022, nine students had been recruited. This number grew significantly in Fall 2023, resulting in 30 LSAMP Scholars.

Dedicated STEM Academic Advising. Students reported LSAMP STEM advising was more specific than general academic advising in breaking down what courses were needed in order to transfer to the university of their choice. Students also shared that LSAMP STEM advisors were beneficial in helping students identify their interests.

Student-led STEM Skill Building and Peer Support. In Fall 2022, PHSC started offering events, and one event was led by a student. This number grew slightly in Year 3 (Spring 2023–Fall 2023), with three different events led by students. Across grant years, students reported satisfaction with student-led STEM events.

Research Experiences for Undergraduates. Staff reported one student had applied for a Summer 2023 Research Experience for Undergraduates (REUs) in Year 3 (Spring 2023–Fall 2023). In Fall 2023, staff supported two students in applying for REUs for Summer 2024.

STEM Conference. Several conference opportunities were offered across grant years, including the 2023 Louis Stokes Midwest Regional Center of Excellence (LSMRCE) conference and the Florida Undergraduate Research Conference.

College and Industry Tours. LSAMP Scholars participated in several college and industry tours across grant years. These included a college tour to the University of South Florida and the Institute for Human & Machine Cognition.

LSAMP Research Scholars. Although there were significant efforts, there were no students who participated as Research Scholars during the grant.

LSAMP Community Interns. Although there were significant efforts, there were no students who participated as Community Interns during the grant.

LSAMP Peer Coaches Although there were significant efforts, there were no students who participated as Peer Coaches during the grant.

Institution Successes

Despite being the newest member of the alliance and not recruiting participants until Spring 2023, PHSC made quick progress with recruitment, advising, and providing opportunities for students through activities and conferences.

Recruitment in particular was a success for PHSC, which increased to 30 LSAMP Scholars by the end of Fall 2023. Recruitment efforts included broad dissemination of the opportunity, including asking professors to promote the opportunity in their STEM classes, hosting information sessions, posting about LSAMP on the main college website and within the event section of the website, partnering with other programs on campus, and asking advisors and administrators to send students to LSAMP STEM advisors. In addition, institution staff leveraged other events as recruitment opportunities. During the final grant year, staff invited high schoolers to a STEM recruitment event at iFly with current LSAMP Scholars to encourage participation. In Spring 2023, staff used the virtual STEM Summit as an opportunity to share LSAMP with students at PHSC and encourage them to join. Finally, staff reached out to students who fit within the broader parameters of LSAMP requirements. These efforts paid off and resulted in higher numbers of participating students.

STEM advising as part of the program was also a major success. Students were thankful for the LSAMP advisor and shared STEM advising offered much more precision in terms of what they needed to achieve and helped ensure they could successfully transfer to a four-year institution. In addition, the LSAMP advisor had helped students determine their interests and their goals after college:

> *I love Miss Courtney so much. She's definitely helped me with advising. She's actually helped me figure out what I want my major to be and what I'm going to be in with going into USF. So she's definitely help guide me and help understand what my interests are and breaking down exactly what would be best for me in the future.*

Finally, engagement opportunities were a success for the college. Some examples included trips to the Clearwater Aquarium, an experience at iFly which included a workshop with a NASA Systems Engineer, a resume event, and a workshop on learning how to dress properly in business settings. In addition to activities at the college, students participated in conferences such as the National Association for Community College Entrepreneurship (NACCE) STEM/Shift Summit through NASA; four students from various backgrounds competed together to develop an app using NASA technology and placed in the top three. These students received funding to start a business and develop the app. Students and institution staff noted these opportunities help students to increase their sense of belonging in STEM and narrow down their plans for the future. One student shared:

> *In my experience going to the conferences and events with other LSAMP students, I've been able to find more people who look like me who are also minorities. Maybe people who are of the same religion, ethnicity, things like that. So I do feel like very represented in STEM and it does make me feel like I belong when I attend those events.*

Indeed, students reported LSAMP had been a great opportunity for them to build relationships with like-minded people. When speaking about LSAMP one student commented:

> *I think it's been a great opportunity to help me build a community of like-minded people. I've made a lot of friends in LSAMP and what I really love is the team-building activities that we do, like the events that we attend and like the trips. And also like sometimes we'll have after-school events where it'll be collaboration and activities. And I think that's pretty fun. It's a nice way to spend my time, like outside of studying and it's kind of like a break away from that.*

Other students described how participation had allowed them to feel more comfortable choosing to go into STEM:

> *Every time we have a meeting or something, I definitely see the diversity in the people there--instead of just one exact field of people--so it definitely feels more welcoming to for me to come into the field.*

Institution Challenges

While institution staff successfully recruited 30 students the final year of the grant, recruitment was noted as a challenge by the institution. Staff commented that recruitment took significant time and effort. Encouraging active student participation after recruitment was also a challenge. Although some students were heavily involved, others did not attend events regularly. Institution staff believed that might have been related to whether events were in-person or online. Staff acknowledged the benefits of in-person events, particularly in terms of community building. However, they noted online events often had higher participation numbers because students could join from anywhere.

STEM professionalization opportunities were also a challenge for students at PSHC. Staff shared there were limited opportunities for students to participate as Research Scholars on campus; project staff reached out to other colleges and institutions to try to find opportunities for their students but made limited progress. Another STEM professionalization challenge was a result of the requirements for the Peer Coach position; to be a Peer Coach, students must have already been a Research Scholar. Finally, institution staff did not recruit for the Community Intern opportunity as it could have been a conflict with Florida's DEI regulations.

Evidence of Sustainable Efforts

The LSAMP team at PHSC strengthened their relationship with local colleges and other LSAMP alliances. These relationships are beneficial and will contribute to the success of STEM students at PHSC regardless of funding status.

Polk State College

Summary of Student-Focused Activities

Polk State College (PSC) is comprised of two campuses and had the second oldest affiliation with the alliance. During the time period of the grant, the college implemented all project components. An overview of the progress with each student-focused activity is presented below.[7] Department/institution activities and faculty activities are presented in the next chapter.

Summer Bridge. Polk State College employed an in-person model for their Summer 2022 Summer STEM Institute (SSI) that resulted in 13 students participating. The following summer, Polk State College moved to a hybrid model. The college did not have many first-time-in-college students (exact number unknown) attend SSI in Summer 2023; however, the event was advertised well within the college and some of the college's STEM Club students attended.

Appropriate Math Course Placement. Polk State College was unable to offer math waivers for students. Math waivers were funded by institutions, if possible.

Student Recruitment and Engagement. Polk State College had a slight increase in LSAMP Scholars during grant years; however, growth was not expected since PSC was forced to cap program enrollment due to limited advisor capacity to serve students. In Fall 2021, 60 students were engaged as LSAMP Scholars. By Fall 2022, the number had increased to 93 LSAMP Scholars. Finally, in Fall 2023, the institution had 69 LSAMP Scholars enrolled.[8]

Dedicated STEM Academic Advising. Students reported positive experiences with LSAMP STEM advising in that it was more specific in guiding them toward appropriate courses for transferring to the university of their choice, advocating on their behalf, and helping them navigate financial aid. LSAMP faculty also shared efforts to take care of students holistically, such as addressing mental health and providing access to a clothing closet for students.

Student-led STEM Skill Building and Peer Support. Due to the STEM Club, events were frequently led by LSAMP Scholars, either partially or fully. In Year 2, 46 different events were led by students. In Year 3, the exact number of events led by LSAMP Scholars was not available due to advisor turnover. Across grant years, students were satisfied with student-led events.

Research Experiences for Undergraduates. Students applied for and participated in Research Experiences for Undergraduates (REUs) across grant years; however, the exact number was unavailable due to advisor turnover.

STEM Conferences. Several conference opportunities were offered across the grant term including the Louis Stokes Midwest Regional Center of Excellence Eaton Student Experience in Fall 2023 and the Community College Innovation Challenge.

[7] The STEM Club advisor left the institution in late Fall 2023, which resulted in significant amounts of implementation data being unavailable for Year 3.
[8] Due to limited and missing data, engagement of LSAMP Scholars is unable to be reported.

College and Industry Tours. LSAMP Scholars participated in several college and industry tours across grant years. This included a visit to Duke Energy and Florida A & M University.

LSAMP Research Scholars. Fifteen students engaged as Research Scholars across the grant term.

LSAMP Community Interns. Nine students engaged as Community Interns throughout the grant term.

LSAMP Peer Coaches. One student engaged as a Peer Coach during the grant term.

Institution Successes

Polk State College experienced consistent success with recruitment, resulting in an active LSAMP program. In the first year of the grant, project staff explained they had to limit additional students joining LSAMP due to a limit in advisor capacity. Despite success with recruitment, Polk State experienced a similar challenge to other alliance institutions, which was capturing students in their first year at the college. During the last year of the grant, Polk State College took a different approach and began to visit all First Year Seminar classes, which were required for all new students. This strategy allowed project staff and peer mentors to share the opportunity early with PSC students.

The college also had an active STEM Club, which contributed to a feeling of community. Students, staff, and faculty built strong relationships as evidenced through students maintaining contact with institution staff and coming back to campus to participate in LSAMP events and presentations.

LSAMP Scholars commented on the benefits of LSAMP, explaining how participation had allowed them to grow. For some students, growth was related to gaining a better idea of career opportunities. One student shared their experience:

> *Through the STEM Club and LSAMP we have the STEM speaker series. We found out about so many careers that we did not know were possible. Things like geomatics--we never knew that was possible. And it's like--it gives people another option of not just becoming a doctor or an engineer, and they can go out into the field and do fieldwork.*

Other students reported growth in soft skills. One student explained LSAMP participation supported students in "*growing our discipline and character when it comes to achieving our goals*." Other students discussed gaining skills in public speaking and project planning. A comment by one LSAMP Scholar described the growth they experienced through participating:

> *I'd say the most significant change for me has been learning what it takes, because prior to coming in, you don't really know what it really takes to do these things or get into these things. But going into it, you're obviously an undergraduate. . . . You have no idea about it, I hate to say it, but in a sense it just teaches you the skills you need to get through this process and to get through every single process as you are getting into your career.*

Faculty also shared stories of LSAMP Scholar growth:

It's seeing students grow. They've taken something that they're passionate about, that they envision for the future in one way or another, and they've not just executed it, but they've also grown social-wise--You can see the confidence in them, you can see that they're writing increases, their critical thinking increases as well, which in and of itself leads to even more successes across their academic and professional journey. . . . So really being able to see the before and the after has been really--has brought me a lot of joy to see just that growth. And that they can do it!

A success at PSC was also the implementation of STEM professionalization experiences. Institution staff shared that their scholars were passionate about their projects—with many research projects being developed from their own communities or community internship experiences—and that their projects were on a wide variety of topics applicable to the community, such as the impacts of AI on education and the effects of cocaine on the mental limbic system. Polk faculty also held monthly meetings for the LSAMP Scholars to train them on topics related to the STEM professionalization experience, including being mentored, research 101, ethics, and transparency in research. A faculty member spoke about the benefits of this opportunity:

> *We have students doing research and then they are eager to jump into community projects. They are really starting, getting a sense of how to do that. And I think that this is the most exciting part--seeing them committed. . . . And this is most like, for me, you know, making me happy that they really like it, so that they see purpose in what they do.*

Institution Challenges

The main challenges at Polk State College were related to budget restraints and the transition of the LSAMP STEM advisor.

Budget restraints at the college limited the number of students who could be served as well as hands-on activities and opportunities for students to attend conferences and field trips. Each institution was allotted a certain amount of funding from the grant and PSC shared that more funding would have allowed them to hire an additional advisor or send more students to conferences. Student leaders viewed these types of activities as key recruitment tools because they captured students' attention and enticed them to join the STEM Club and LSAMP.

The other major challenge was the transition of the LSAMP STEM advisor in Fall 2023 who had been involved in the program across the grant term and in the prior LSAMP grant. The unexpected departure of this advisor resulted in some data loss for Year 3 (Spring 2023–Spring 2024). The college was able to quickly fill the position and avoid a significant gap in services. In re-hiring for this position, the institution decided to position two advisors with diverse but complementary experience in this role.

Evidence of Sustainable Efforts

Overall, LSAMP and the STEM Clubs were viewed as ingrained components of Polk State College's institutional structure. Project staff were able to secure some funding from the college to establish a new program, *Soar Higher in STEM*. This program is designed to build on the success of LSAMP and includes many of the components from the project including dedicated STEM advising, summer bridge programming, appropriate math course placement, peer-led supports, college tours, and STEM conferences.

Valencia College

Summary of Student-Focused Activities

Valencia College (VC), comprised of nine campuses, initiated the first LSAMP grant and served as the lead of this LSAMP grant. During the time period of the grant, the college implemented all project components. An overview of the progress with each student-focused activity is presented below. Department/institution activities and faculty activities are presented in the next chapter.

Summer Bridge. A hybrid Summer STEM Institute (SSI) was held by Valencia College for the alliance in Summer 2022; 14 participants from Valencia attended. VC employed a hybrid model for their SSI in Summer 2023 as well, resulting in 29 student participants.

Appropriate Math Course Placement. Students met with their advisors while attending Summer Bridge to discuss math course placement and obtain math waivers. Overall, five students utilized these waivers.

Student Recruitment and Engagement. Valencia College demonstrated significant growth in the number of LSAMP Scholars throughout the grant. In Fall 2021, the college reported 40 LSAMP Scholars. By Fall 2022, this had grown to 75 LSAMP Scholars. The number further increased in the final year of the grant, with 94 LSAMP Scholars enrolled by the end of Fall 2023.

Dedicated STEM Academic Advising. Students reported positive experiences with dedicated STEM academic advising throughout the grant; they indicated it was much more focused than the general academic advising provided through Valencia and was helpful for ensuring they were taking the correct courses to transfer to the university of their choice.

Student-led STEM Skill Building and Peer Support. Valencia maintained several STEM Clubs, which were opportunities for LSAMP Scholars and other students to lead events and club meetings. In Year 2, 57 events were student-led. In Year 3, 103 events were student-led. Across grant years, students were satisfied with student-led workshops and peer supports.

Research Experiences for Undergraduates. Staff reported many students applied for Research Experiences for Undergraduates (REUs) across grant years. Participants included one student at the American College of Cardiology and another with Ohio State University. In addition, project staff supported students in preparing 80 applications for the Siemens Summer Work Experience Program in Fall 2023, which had 15 available positions; Valencia LSAMP Scholars won 12 of those positions and participated in the internship program in Summer 2024. In addition, Siemens decided to award nine of these students with paid internship positions starting in Fall 2024; eight students chose to participate.

STEM Conference. Students participated in national conferences, such as the Emerging Researchers National Conference in STEM, the Florida Undergraduate Research Conference, and the Annual Biomedical Research Conference for Minoritized Scientists.

College and Industry Tours. LSAMP Scholars participated in college and industry tours across grant years. These included trips to the Kennedy Space Center and Florida A & M University.

LSAMP Research Scholars. Forty-one students participated as Research Scholars throughout the grant.

LSAMP Community Interns. Eighteen students participated as Community Interns throughout the grant.

LSAMP Peer Coaches. Sixteen students participated as a Peer Coach throughout the grant.

Institution Successes

Valencia College demonstrated success in their implementation of the LSAMP program. Institution staff recruited in various ways, including visiting local high schools, speaking in STEM courses, and attending registration help day and activity fairs. This resulted in large numbers of participants at the college—94 LSAMP Scholars were enrolled at the end of Fall 2023. The college offered a wide range of activities for students including hosting career fairs, networking events, workshops, and social events. During one of the student focus groups, students described the VC LSAMP community as a family. Another student shared how LSAMP programming enhanced their overall experience of community college, as this student's comment illustrated:

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

The Summer STEM Institute allowed institution staff to connect with STEM students earlier to engage them in LSAMP. Valencia successfully recruited for this opportunity two years in a row. Students who participated in SSI spoke positively of their experiences. One student explained how participation ignited a passion for STEM:

> *I didn't apply to any colleges. My parents made me apply to Valencia and I saw the opportunity [to participate in SSI] and I said, well, it's something to do for the summer. All the professors were really nice. They teach you a lot of things that are like, wow, this is actually interesting; in math, in genetics, that you feel like it's a hard class, but they teach it in a fun way that you can understand it. And after I finished my research project, being able to talk about that in front of everybody was a really nice experience. Being able to do the whole process of the research, discovering something and seeing all these stories of people what they've done through LSAMP, where they've been, it was an eye-opening experience. The next day I was over at the advisor's office just knocking on the door. Being like, how can I do more? So it's those types of experiences that really leave a mark on people.*

Valencia excelled at offering STEM professionalization opportunities and supporting students in going beyond Valencia to work with REUs and internships. As previously noted, the institution

had at least 10 students participate in REUs or internships in the final year of the grant. One student described their experience:

> *I received an internship as a freshman in college, a paid internship with the University of Maryland. And now this summer, which will be my second summer in college. I received another paid internship with Ohio State University.*

Institution staff spoke about the opportunities provided to students through conferences, internships, and REUs:

> *I get excited to see the paperwork come in about the students going someplace and being able to see things. Because when I was on the academic side, a lot of our students didn't get a chance to go places and see things that are out there in the world to know that they can attain these things. They can be more than just what is in the box. They can come outside of that box.*

Staff shared the power of LSAMP and how it opened doors for students:

> *It is such a blessing. That's the best way to say it. Such a blessing to have LSAMP because LSAMP is opening doors for people that wouldn't have had the opportunity. So, I don't know where we're going from here, but I hope we're still going up.*

Through these opportunities, students gained experience and built skills with research processes, research communication, and even professionalism. However, for students LSAMP was more than this and allowed them to determine their pathway and explore options. One student described their experience:

> *So I'm new to Florida, so not only new to the school, I was new to the state, so I was very unclear of my pathway. So when I heard about LSAMP and how it gives opportunities to people that come from minority backgrounds, I thought it would be a very great program for me to get into to just basically network and do a lot of research and just go out and explore my options.*

Institution Challenges

Valencia College experienced several challenges which included determining the best modality for activities and implementing Peer Coach activities.

One challenge was a desire to hold more events and activities in-person and understanding that in person events was not always possible due to the reality of students' lives and needs. For example, the SSI would have ideally been eight-hour, in-person days. However, students noted they had barriers to participation related to work responsibilities or travel. Valencia College began to modify some programming (e.g., SSI, LSAMP workshops) to a virtual or hybrid modality to accommodate student needs and increase engagement when possible.

In addition, institution staff reported students were reluctant to engage with Peer Coaches. Specifically, staff shared it seemed sometimes LSAMP Scholars did not want to communicate with Peer Coaches, or they did not think they need to use them. Staff explained these

challenges to the Peer Coach, and she worked around the challenges. As a result, engagement with the Peer Coach improved.

Evidence of Sustainable Efforts

Since 2016, Valencia College has sustained three dedicated advising positions through college funds. The undergraduate research community of faculty, staff, and administrators has grown since the college began to offer undergraduate research to students through co-curricular program engagement. The college will develop a STEM strategy to support its current strategic impact plans to effect change in college access, graduation, transfer success, and career credentials. The best practices, successes, and lessons from this project will inform the planning and implementation of the collegewide strategy.

Meanwhile, the college, anxious to sustain momentum from LSAMP, will launch a Community United for Success in STEM (CUS-STEM). CUS-STEM will operate as an intentional community of Valencia STEM students, faculty, staff, and administrators. The program will offer dedicated advising, coaching, and mentoring for STEM students joining the community. CUS-STEM will also offer participants opportunities for STEM professional experiences through undergraduate research, peer coaching, and summer internships. A summer bridge program will be provided for a limited number of incoming STEM students who become members of the CUS-STEM as part of their transition into college. In addition to CUS-STEM, Valencia now offers course-based research both inside and outside of the Honors College.

Chapter Three: Alliance-wide Results

This chapter summarizes alliance-wide results, including outcomes.

Alliance-wide Implementation Findings

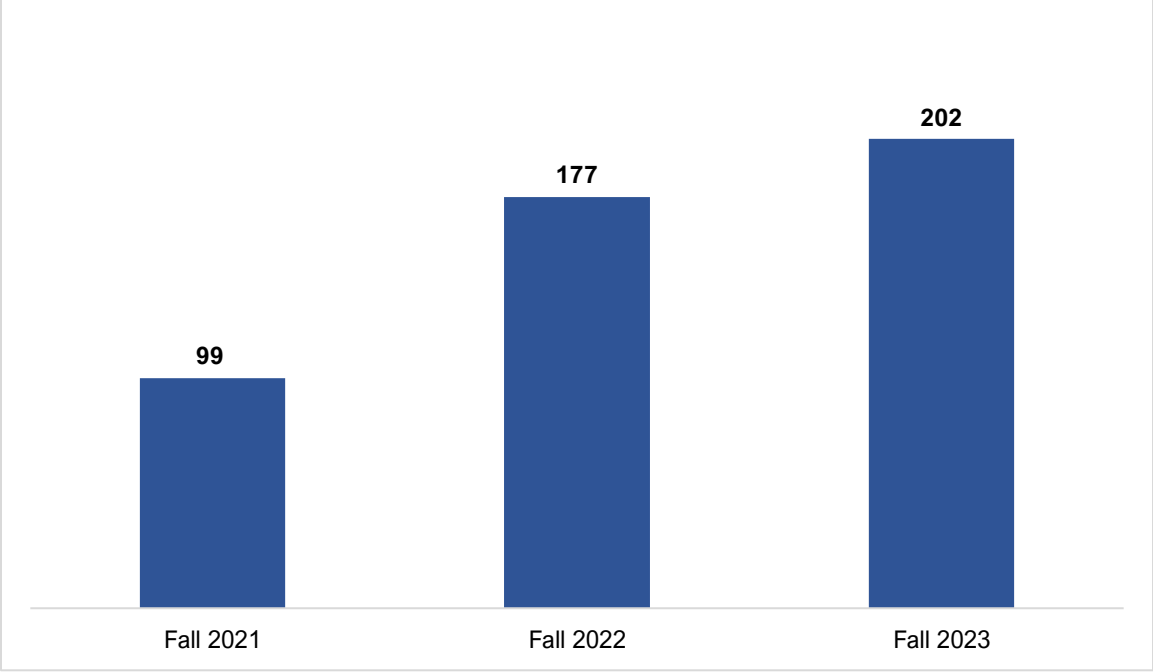
In this report section, overarching alliance findings about implementation are presented. Successes for the alliance included increasing the enrollment of LSAMP Scholars, engaging these students and offering a variety of opportunities for them, engaging faculty, and the efforts of the Governing Board. Challenges for the alliance are primarily related to the recently implemented Florida Senate Bill and the work on agreements with partner universities. Details are provided in the sections below.

Alliance Successes

Enrollment

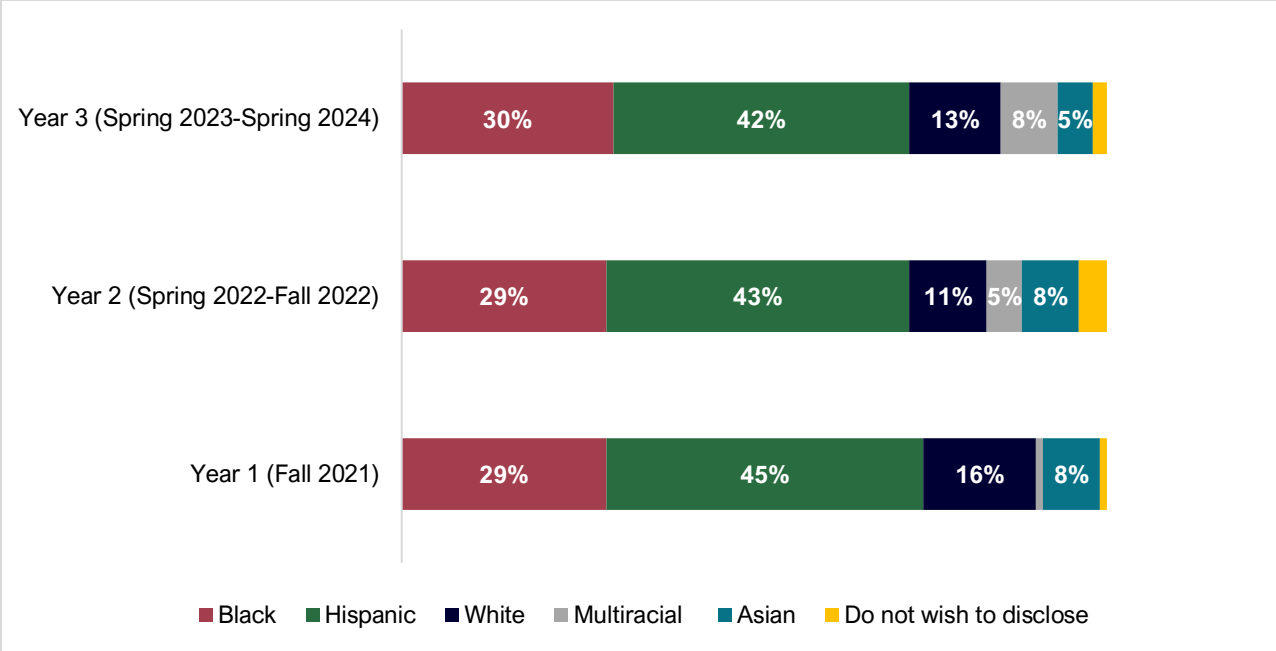
Recruitment efforts across the alliance intensified across the grant term, with partner institutions using new strategies to find students who fit the profile of an LSAMP Scholar. This ultimately resulted in 202 LSAMP Scholars being enrolled by the end of Fall 2023, an increase from the previous two years (Figure 1).

Figure 1. Alliance-wide LSAMP Scholars, by Year



Across the grant period, demographics were similar, with 73% of LSAMP Scholars belonging to racially and ethnically minoritized groups. The majority of students identified as Black (29%) or Hispanic (43%). No students identified themselves as Native American or Native Hawaiian or other Pacific Islander (Figure 2).

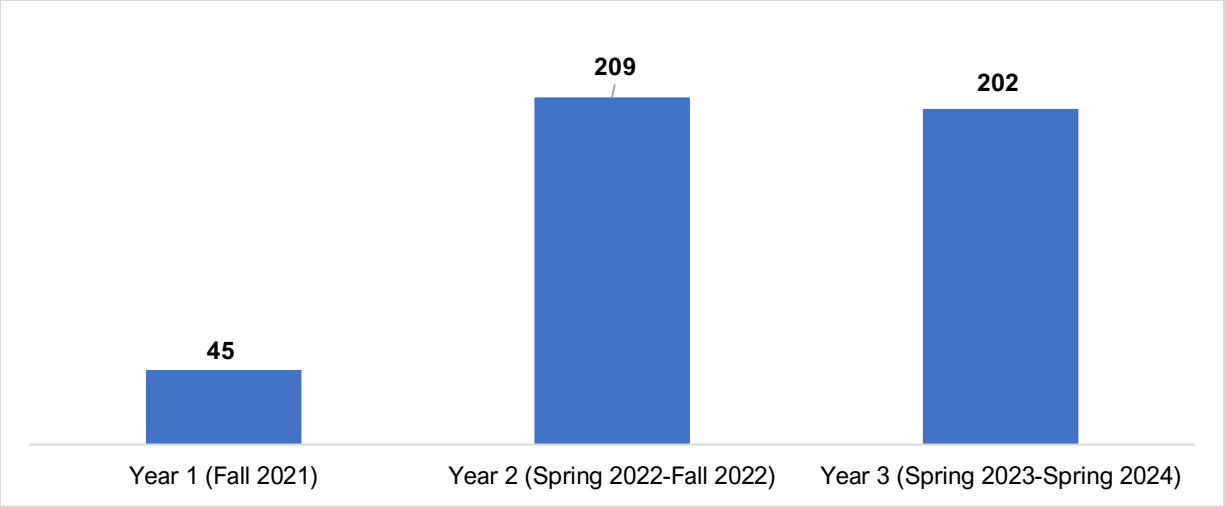
Figure 2. LSAMP Member Demographics Across Years



Engagement

Across the alliance, over 456 activities were hosted throughout the time period of the grant (Figure 3).

Figure 3. Alliance-wide Engagement Opportunities by Year



Staff balanced providing a mix of in-person and virtual opportunities for members with more in-person events were offered in later project years (Figure 4). Across grant years, the percentage of events coordinated by students (i.e., partially or fully) increased from 13% of events (*n*=6) in Year 1 (Fall 2021) to 62% of events (*n*=126) in Year 3 (Spring 2023-Spring 2024; Figure 5).

Figure 4. Alliance-wide Engagement Opportunity Modality, Year 3 (*n*=133)

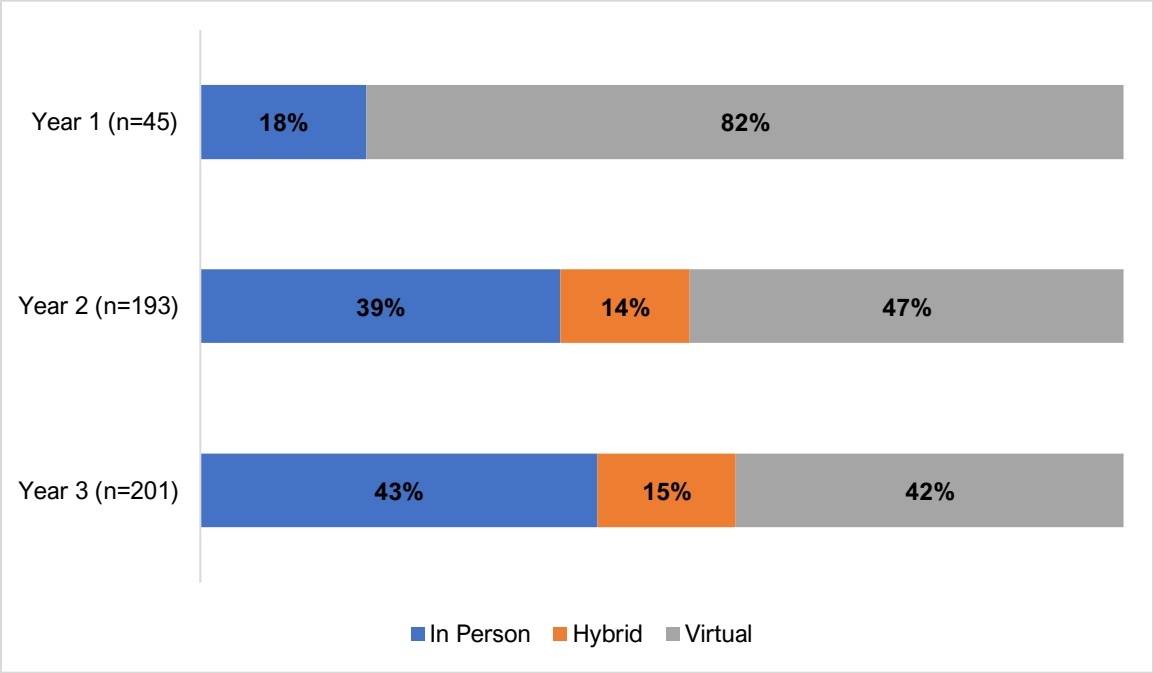
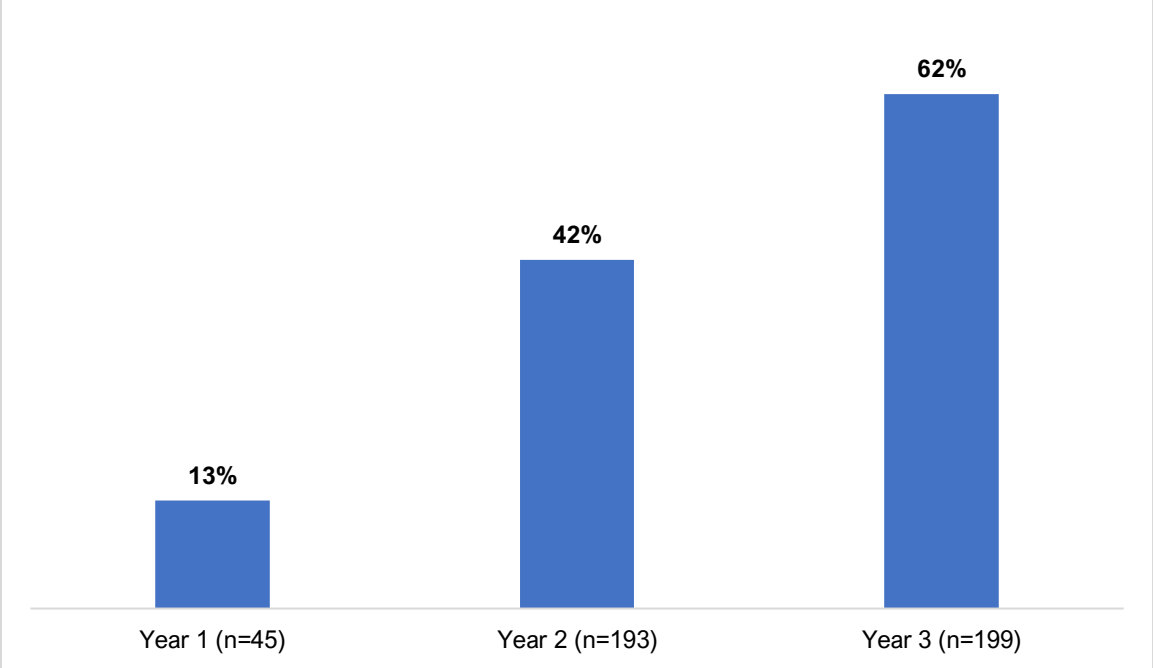


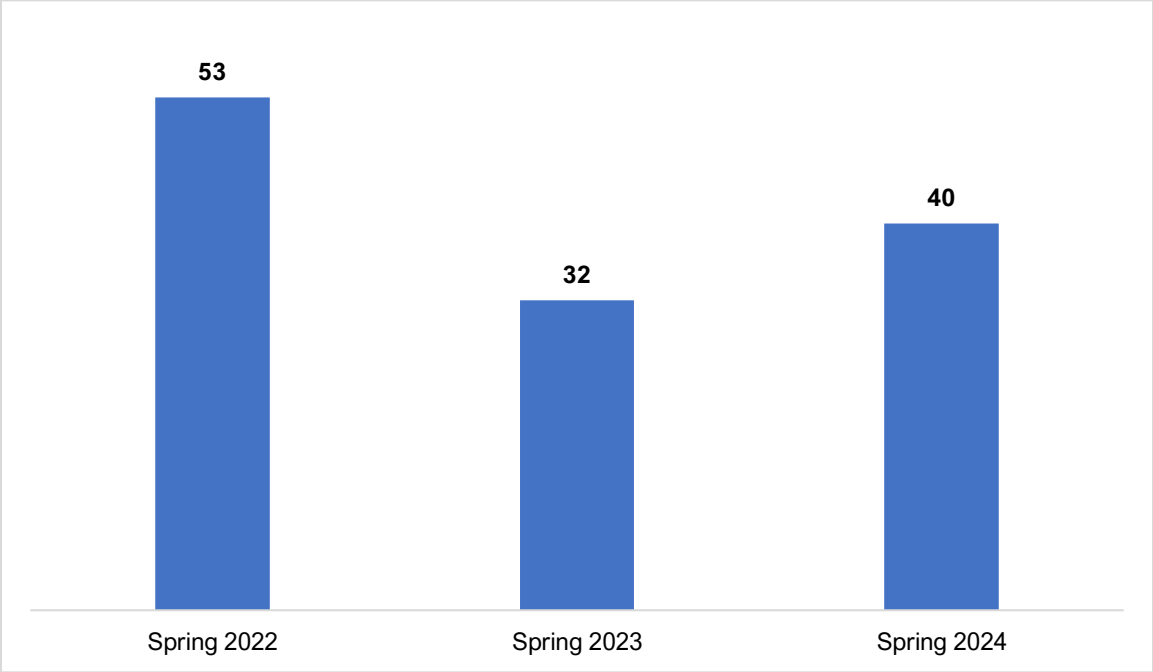
Figure 5. Engagement Opportunities Fully or Partially Planned by Students by Year



STEM Summit

In addition to opportunities offered by alliance partners, students were invited to attend the annual STEM Summit held by the CFSA. STEM Summit was held annually each spring and throughout grant years was held in different modalities (i.e., virtual, hybrid, in-person). Overall, 169 students (potentially duplicated) attended a STEM Summit (Figure 6).

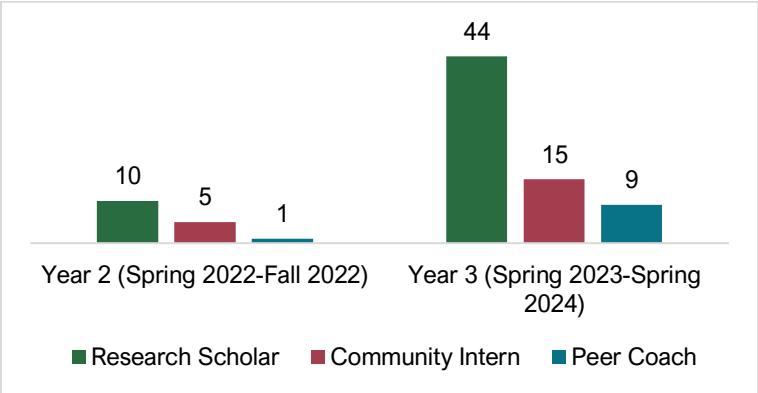
Figure 6. STEM Summit Student Attendees by Year



STEM Professionalization

Starting in Spring 2022, the CFSA engaged students in STEM professionalization experiences. Overall, 83 students across the alliance participated as Research Scholars, Community Interns, or Peer coaches. The Research Scholar opportunity was most prevalent, with 54 students participating throughout the grant (Figure 7).

Figure 7. Alliance-wide Number of Students Engaged in STEM Professionalization by Year

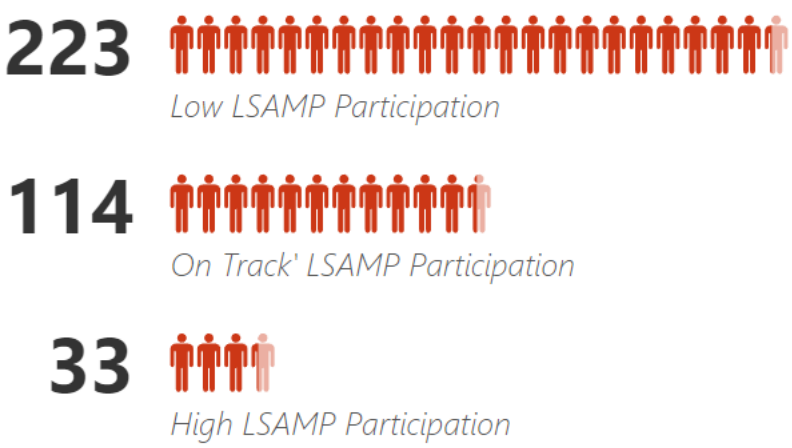


To satisfy participation requirements, students involved in STEM Professionalization opportunities were expected to complete a required number of hours (i.e., 25 hours for Community Interns, 40 hours for Research Scholars or Peer Coaches) and to complete a culminating project. Across both years, 81% of participants (*n*=61) completed the hour requirement and 81% of participants (*n*=61) completed a culminating project.

Levels of Participation

An analysis to determine the range for each level of Scholar participation was conducted using Fall 2022-Spring 2024 data for 370 LSAMP members (potentially duplicated). Of those 370 students (Figure 1), 33 students (8.92%) were categorized as having high levels of participation in LSAMP in a year, 114 students (30.81%) had "on track" participation in LSAMP in a year, and 223 students (60.27%) had low levels of participation in LSAMP in a year (Figure 8).

Figure 8. Participation in LSAMP across LSAMP Scholars (*n*=370)



Faculty and Staff Involvement

Faculty and staff were involved in LSAMP activities across the alliance to support students in a variety of ways. Faculty were involved 941 times in student-focused LSAMP activities across the alliance. Institution faculty and staff were involved in many ways including advisors, research mentors, and guest speakers.

Governing Board

Spring 2022 saw the formation of the Governing Board, comprised of the president from each institution. The Governing Board consistently met bi-annually to discuss the current status of LSAMP, challenges across institutions, and opportunities for additional support. The Governing Board also discussed and agreed upon other major decisions, including the no-cost extension.

CFSA Workgroups

CFSA workgroups 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 early Year 2 (Spring 2022–Fall 2022). CFSA workgroups primarily conferred at Quarterly Alliance Meetings in Year 2, but progress was limited. This was attributed to work group assignments being made initially in Fall 2021 before the partner institutions had fully filled their LSAMP-related positions or identified faculty willing to participate. Consequently, individuals were assigned to several different work groups, making it difficult for them to be present at all of the assigned group meetings.

The CFSA workgroups made significant progress in Year 3 (Spring 2023–Spring 2024). All groups met at least quarterly as part of the quarterly alliance meetings, with some workgroups meeting more frequently. Each workgroup is composed of representatives from each institution. In Fall 2023, workgroups established a set of deliverables that would be completed by the end of the academic year. Sample deliverables included compiling a master list of REU opportunities, developing an annotated list of all identified CFSA community partners to be made available to all CFSA institutions, and methods for financial subrecipient monitoring.

Challenges

Agreements

The department/institution-focused fidelity measures included developing articulation agreements, STEM degree pathways, and data sharing agreements with university partners. Although workgroups had initiated efforts on these tasks during the grant years, no agreements or pathways were established by the end of the grant.

Outcome Evaluation

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

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

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

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

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

For information on the method used in analyzing LSAMP participation data for the outcome evaluation, see the Evaluation Framework in Appendix C.

Strategic Indicators

Alliance-wide strategic indicator data are provided below in Table 2, which presents an overview of baseline and final data (when available). Detailed information about each strategic indicator follows this table.

Table 2. Strategic Indicator Overview

Strategic Indicator	Baseline[9]	Final	Status
SI.1 Increase in LSAMP URMs declaring STEM major	9.2% (Fall 2022)	20.8%	Met
SI.2 Increase in LSAMP URM students maintain GPA of 2.75 or higher	80.2% (Fall 2022)	73.1%	Not Met
SI.3 Increased retention & persistence rates compared to prior grant years & non LSAMP URM STEM students	URM Students (Fall 2021): Retained: 100%; Persisted: 58.3% Non-URM Students (Fall 2021): Retained: 88.8%; Persisted: 50.0%	URM Students: Retained: 56.7%; Persisted: 55.2% Non-URM Students: Retained: 43.75%; Persisted: 50.0%	Not Met
SI.4 Increased participation rate in CFSA activities for students	35% of students participated in 3 or more activities (Fall 2021)	36% of students participated in 3 or more activities in Fall 2023	Met
SI.5 Community relevant STEM opportunities increase student interest and motivation in STEM	Data Not Available	Data Not Available	N/A
SI.6 Increase in LSAMP URM student graduation rates	8.7% (Summer 2022)	8.3% (Fall 2023)	Not Met
SI.7 Increase in LSAMP URM student transfer application and transfer rates to STEM majors in 4-year baccalaureate program[10]	451 Students (prior grant baseline)	635 Students (AY 2023–2024)	Met
SI.8 LSAMP URM students feel they belong in STEM at their institution	Science Identity: Average 3.56/5 Identity as a Scientist: Average 3.39/5	Science Identity: Average 3.74/5 Identity as a Scientist: Average 3.79/5	Met
SI.9 Increase in STEM self-efficacy and identity for LSAMP URM students	Research Self-Efficacy: Average 3.89/5	Research Self-Efficacy: Average 3.90/5	Partially Met

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

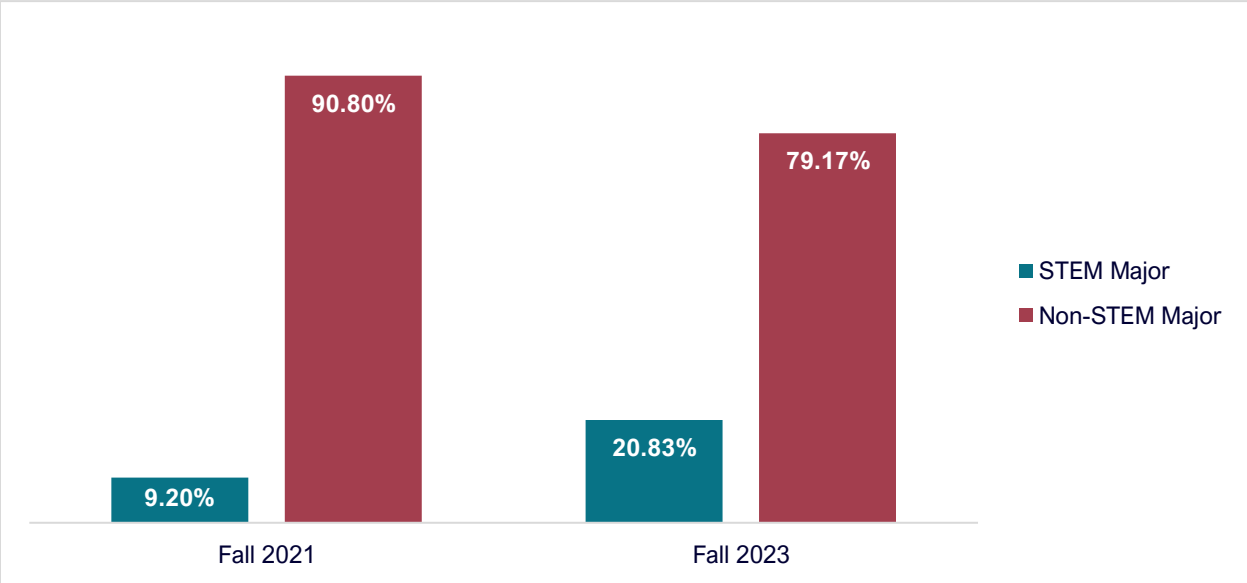
[10] The strategic indicator focuses on transfer data as these are the data provided by the alliance.

	Sources of Self-Efficacy: Average 4.38/5 Confidence as Scientist: Average 3.59/5 Commitment to Science: Average 4.30/5	Sources of Self-Efficacy: Average 4.29/5 Confidence as Scientist: Average 3.66/5 Commitment to Science: Average 4.33/5	
SI.10 STEM self-efficacy and identity maintained after transfer to 4-year baccalaureate program	N/A	N/A	N/A

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

SI.1 was met by the end of the grant, resulting in a 11.6 percentage point increase in LSAMP URMs declaring a STEM major. The baseline for SI.1 was established in Fall 2022 when 14 (9.2%) LSAMP URM[11] students reported being a STEM major (Figure 7). Of these 14 LSAMP URM students, 8 of them had low participation in LSAMP, and 2 had on-track participation. There was 1 PHSC student and 13 Valencia students who reported being a STEM major in Fall 2022. Further, 7 of the 13 Valencia LSAMP URM students were male and 6 were female.

By comparison, during Fall 2023, 10 (20.8%; Figure 2) LSAMP URM students reported being a STEM major. Of these 10 students, 1 (10.0%) had high, 3 (30.0%) had on track, and 6 (60.0%) had low participation in LSAMP. There were 4 PHSC students and 6 Valencia students who reported being STEM majors during Year 3. Of the 10 URM students, 6 were female and 4 were male.



[11] LSAMP is open to all students, however, the alliance intends for 90% of participants to be URM students. NSF defines these students as students who identify as Black, Hispanic or Latino, and American Indians or Alaska Natives (https://ncses.nsf.gov/pubs/nsf23315/report/glossary).

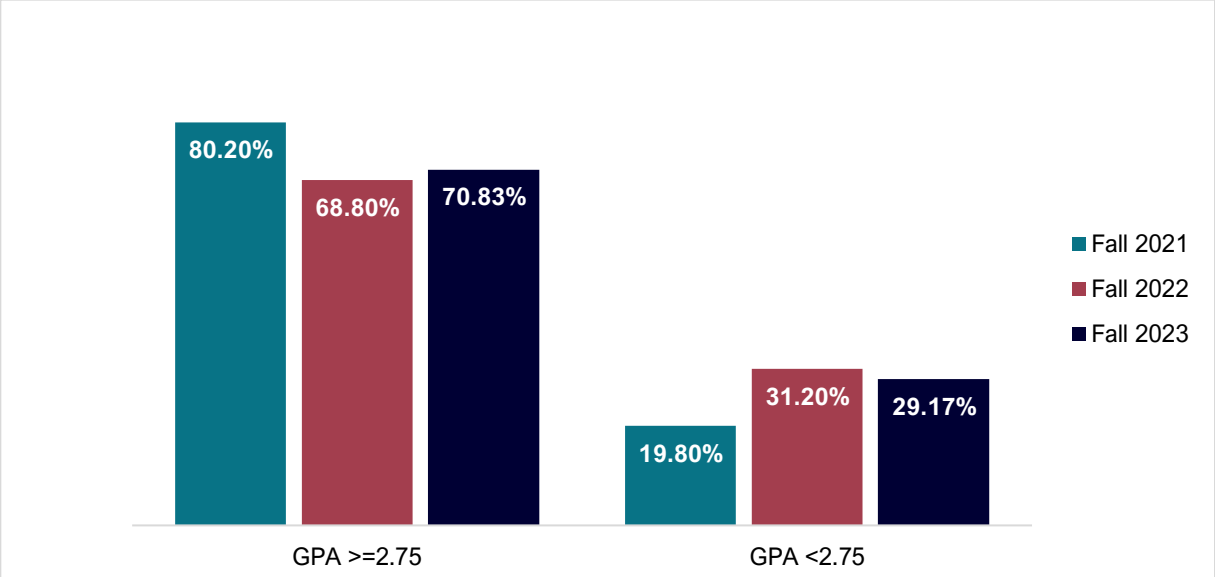
Strategic Indicator 2: Increase in LSAMP URM Students Maintaining a GPA of 2.75 or Higher

SI.2 was not met by the end of the grant; there was a 7.1 percentage point decrease in LSAMP URM students maintain a GPA of 2.75 or higher by the end of the grant. The baseline for this indicator was intended to come from prior LSAMP grant data. While it is not possible to report an aggregate percentage of CFSA LSAMP URM students maintaining a GPA of 2.75 or higher from Fall 2017,[12] the percent of CFSA URM students earning a GPA of 2.75 or higher ranged from 37.3% (Polk State College) to 57.8% (Daytona State College) in Fall 2017. Due to the lack of an aggregate percentage, the baseline for LSAMP URM students was established in Fall 2021 with 69 (80.2%) LSAMP URM students maintaining a GPA of 2.75 or higher (Figure 8). There were 53 Polk students and 16 Valencia students who earned a GPA of 2.75 or higher in Fall 2021. While this percentage must serve as the baseline, it is higher than the institutional numbers presented in the Fall 2017 report. In Fall 2022, 75 (68.8%; Figure 8) LSAMP URM students held a GPA of 2.75 or higher, demonstrating a slight decrease in the percent of LSAMP URM students with a GPA of 2.75 or higher.

In Fall 2023, 34 of 48 LSAMP URM students (70.8%) held a GPA of 2.75 or higher, demonstrating little change from the prior year (68.8%) and lower than the baseline. Of LSAMP URM students with a GPA of 2.75 or higher, 9 (26.5%) were classified as having high participation, 9 (26.5%) were considered on track, and 16 (47.1%) had low levels of participation in LSAMP. Comparatively, of those with a GPA below 2.75, 21.4% of students had high participation in LSAMP, while 14.3% were on track, and 64.3% had low rates of participation in LSAMP. There were 11 (32.4%) PHSC students and 23 (67.6%) Valencia students who earned a GPA of 2.75 or higher in Year 3. Of LSAMP URM students who had a GPA of 2.75 or higher, 70.6% were female, while 64.3% of students with a GPA below 2.75 were male.

[12] The evaluation plan intended to use data from the prior grant as baseline.

Figure 10. Percent of LSAMP URM Students Earning a 2.75 GPA or Higher in Fall 2021, Fall 2022, and Fall 2023

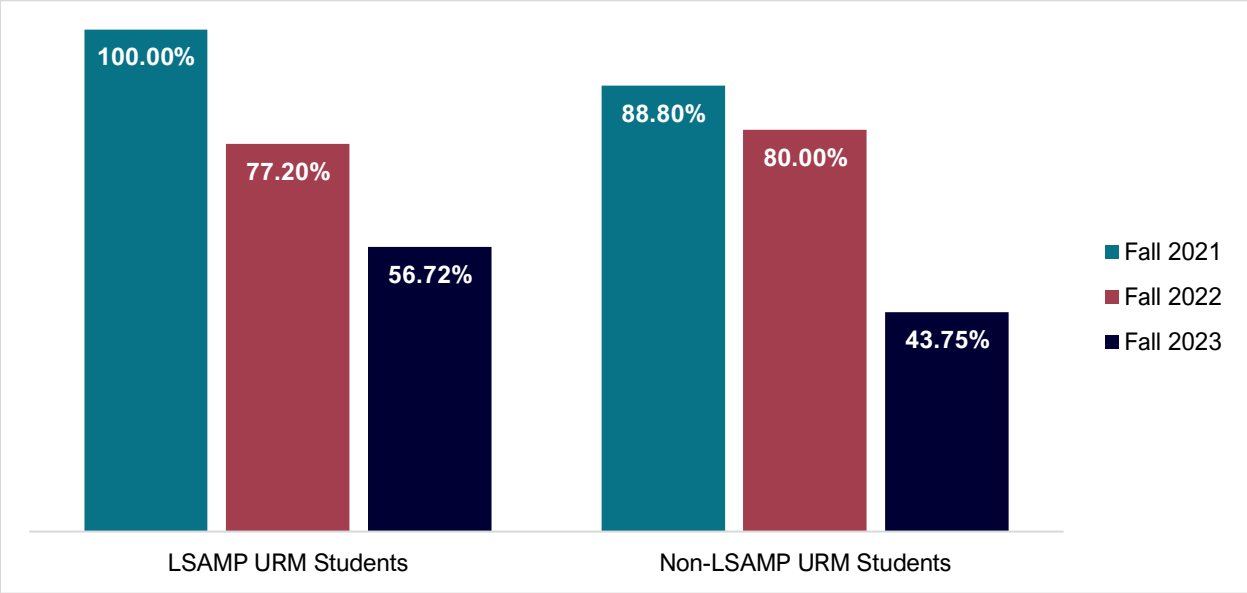


Strategic Indicator 3: Increased Retention and Persistence Rates Compared to Prior Grant Years & Non-LSAMP URM STEM Students

SI.3 was partially met by the end of the grant. During the final year of the grant, LSAMP URM students demonstrated increased retention and persistence compared to their Non-URM peers. However, there was a decrease in the percentage of LSAMP URM students that were retained and persisted compared to the baseline.

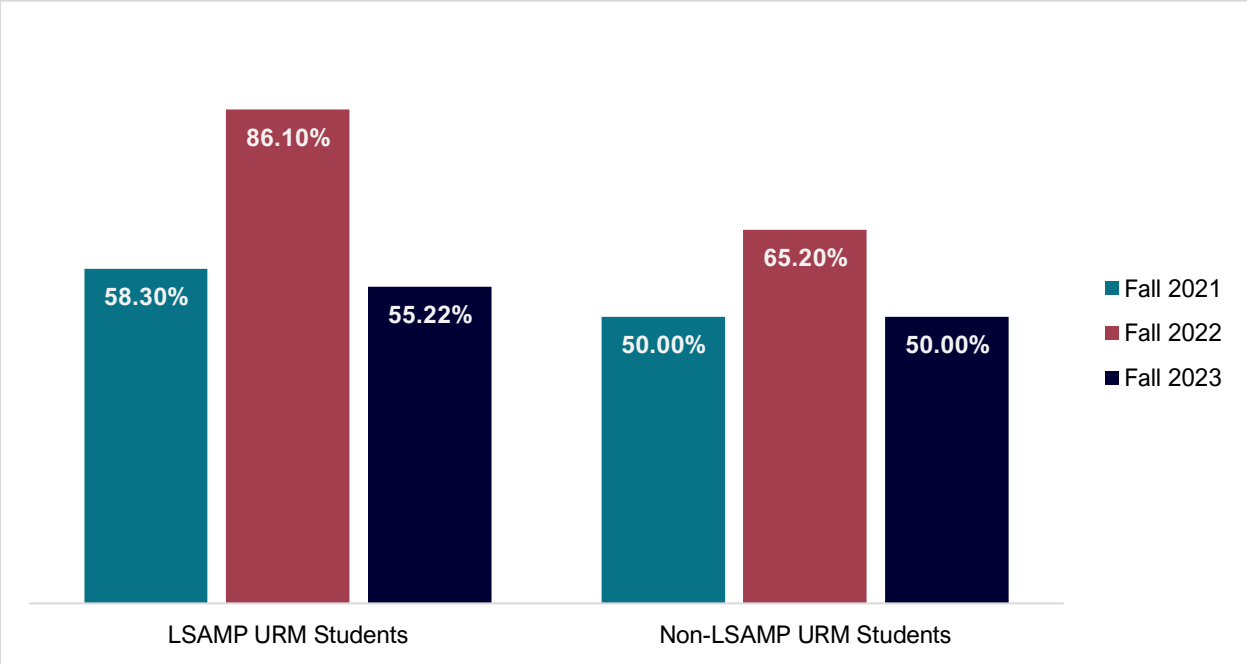
Retention and persistence baselines were established in Fall 2021 with 17 (100%) LSAMP URM students retained. In the following Fall 2022, 74 (77.2%) LSAMP URM students were retained, demonstrating an overall decrease in the percent of LSAMP URM students retained (Figure 9).[14] In Fall 2023, 38 (56.7%) LSAMP URM students were retained, a further decrease in the percent of LSAMP URM students retained since Fall 2022. There was 1 (2.6%) Central Florida, 5 (13.2%) PHSC, and 32 (84.2%) Valencia URM LSAMP students retained in Fall 2023.

Figure 11. Percent of LSAMP Students Retained in Fall 2021, Fall 2022, and Fall 2023



The baseline for persistence was established in Fall 2021, with 14 (58.3%) LSAMP URM students persisting. In the following Fall 2022, 37 (86.1%) LSAMP URM students persisted, demonstrating an overall increase in the percent of LSAMP URM students persisting (Figure 10). In Fall 2023, 37 (55.22%) LSAMP URM students had persisted, representing a decrease in the percent of LSAMP URM students persisting since Fall 2022. There was 1 (2.7%) Central Florida, 4 (10.8%) PHSC, and 32 (86.5%) Valencia LSAMP URM students persisting in Fall 2023.

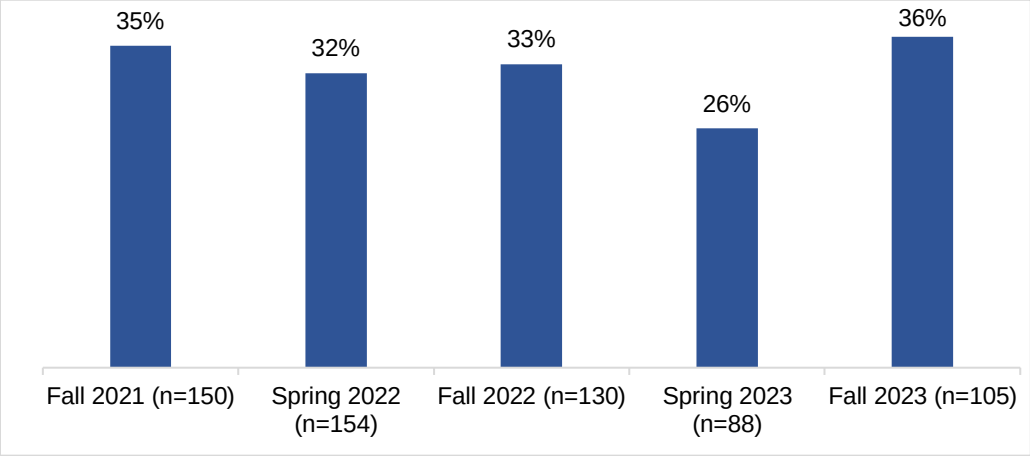
Figure 12. Percent of LSAMP Students Who Persisted, Fall 2021, Fall 2022, and Fall 2023



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

SI.4 was met by the end of the grant, resulting in a one percentage point increase in the number of LSAMP students participating in 3 or more activities in the fall semester. The baseline for the requirement for LSAMP students to participate in three activities per semester was established in Fall 2021 with 35% of LSAMP members (*n*=52) meeting the participation requirement. The percentage of students meeting participation requirements dropped slightly in Spring 2022 (32%) and Fall 2022 (33%). In Spring 2023, the percentage of students meeting participation requirements dropped further to 26% of students (*n*=23). However, it is important to note there were several challenges with the Spring 2023 data set—both the College of Central Florida and Polk State College experienced advisor turnover that resulted in missing data. In Fall 2023, the semester used for final measure, the percentage of students participating in at least 3 activities had increased to 36%, slightly above baseline (Figure 13).[14]

Figure 13. Percentage of LSAMP Students Meeting Participation Requirements by Semester[13]



Strategic Indicator 5: Community Relevant STEM Opportunities Increase Student Interest and Motivation in STEM

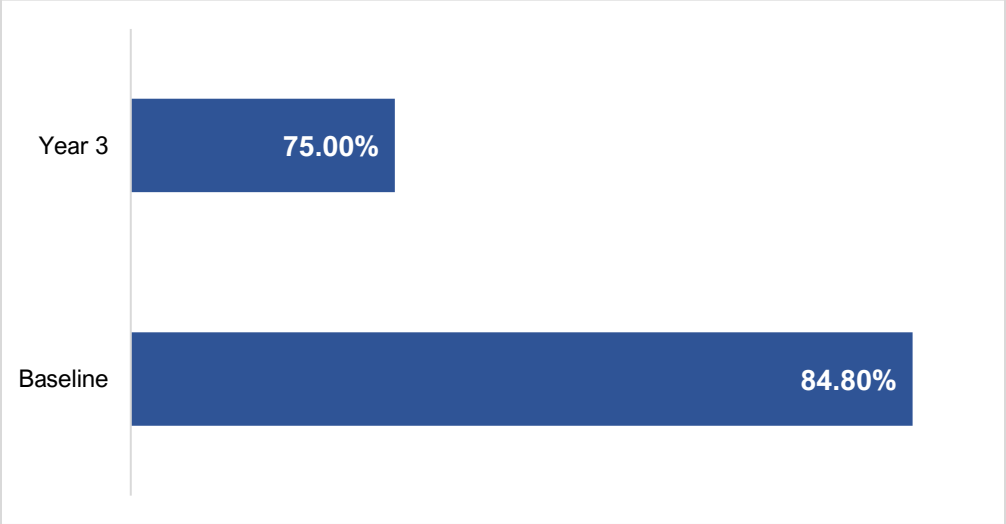
Baseline data had not been collected in Years 1 or 2 due to a need to modify data collection. The external evaluator intended to collect this data in Year 3; however, due to requirements of Florida Senate Bill SB 266, the alliance modified the focus on community relevant STEM opportunities. Therefore, data on this indicator was not collected nor reported. While it is not possible to determine if community relevant STEM opportunities increased student interest and motivation in STEM, data on LSAMP motivation in STEM are provided below.

Of the 132 LSAMP URM students who responded to the measure regarding motivation in STEM in the baseline survey, 112 (84.8%) indicated they planned to graduate as science or

[13] Note: Spring 2023 data does not include Polk State College or the College of Central Florida due to missing data from advisor turnover. Fall 2023 data does not include Polk State College due to missing data from advisor turnover.

engineering majors (Figure 14). On the Year 3 annual survey, 9 (75.0%) out of 12 students who responded to the measure indicated an intention to graduate as a science or engineering major.

Figure 14. LSAMP Student Plans for Academic Major, Baselines and Year 3



LSAMP Scholars were asked about future education plans. Of the 133 LSAMP URM students who responded to the question on the baseline survey, 45 (33.8%) indicated they wanted to pursue a Ph.D. in STEM after graduation and 27 (20.3%) indicated an interest in pursuing an MD/DO degree. At the end of Year 3, 11 LSAMP URM students provided responses about their future education plans. Students were able to select multiple response options, the majority of students (n=4, 36.4%) indicated an interest in pursuing an MD/DO degree or that they did not yet know (n=4, 36.4%). Further, 2 (18.2%) students were interested in pursuing a Ph.D. in a STEM field and 3 (37.5%) students were interested in pursuing an "other" advanced degree (with medical assistant certification, a Ph.D. in psychology, and zoology listed as the specific degrees of interest).

LSAMP Scholars were also asked about career plans. Of the 133 LSAMP URM students who responded to the question on the baseline survey, the majority (30.1%) indicated they wanted to pursue an industry position of technology. Other frequent responses were an industry position for engineering (26.3%), science research (26.3%), engineering research (24.1%), medical practice (20.3%), and technology research (20.3%). At the end of Year 3, 12 LSAMP URM students provided responses about their career intentions after graduation. Again, students were able to select multiple options. Of the majority responses, 5 (41.7%) LSAMP URM students reported an interest in pursuing medical practice after graduation and 3 (42.9%) students indicated an interest in pursuing medical practice, while 4 (33.3%) and 3 (25.0%) were interested in pursuing industry positions for technology and science, respectively. Further, 2 (16.7%) LSAMP URM students were each interested in pursuing the science, medical, and technology research categories in their career endeavors.

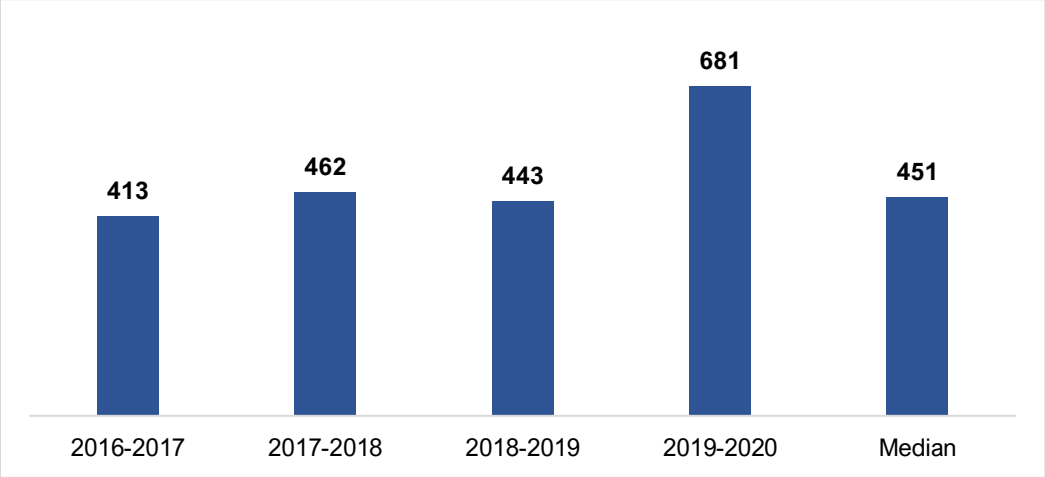
Strategic Indicator 6: Increase in LSAMP URM Student Graduation Rate

SI.6 was not met by the end of the grant; there was a slight decrease in LSAMP URM student graduation rates of 0.4% of students. The baseline for graduation was established in Summer 2022 with 11 (8.7%) LSAMP URM students graduating. There were 8 Valencia students and 3 Polk students who graduated in Summer 2022. There was no significant change in the percentage of LSAMP URM students graduating across Year 3.[17] From Spring 2023 to Fall 2023, 4 (8.3%) LSAMP URM students graduated, with 1 (25%) of those students graduating from PHSC and 3 (75%) of those students graduating from Valencia.

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

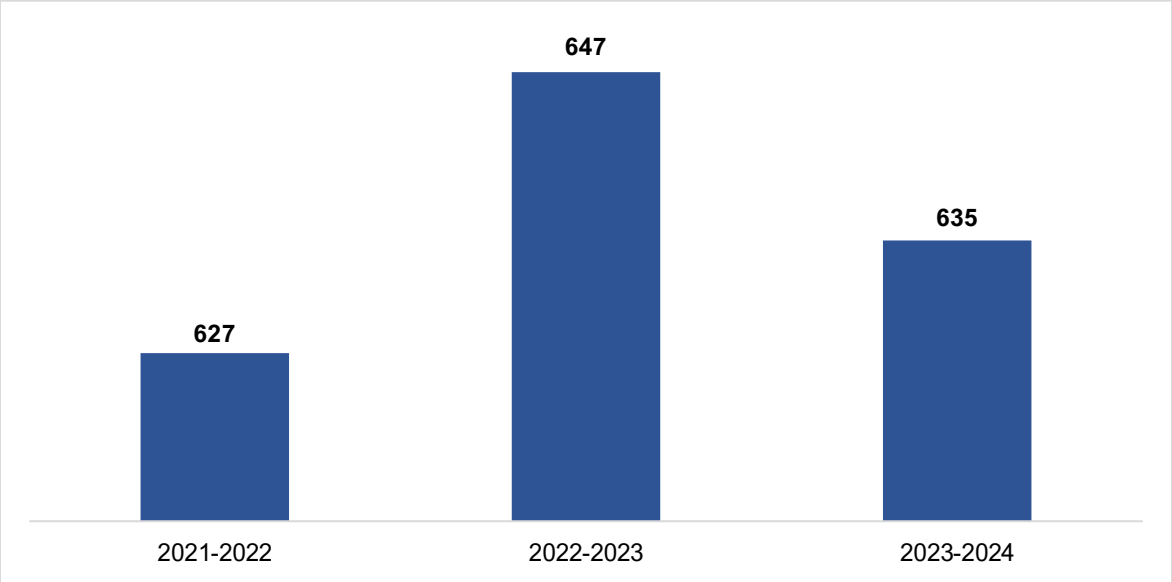
SI. 7 was met by the end of the grant. Regional partner universities provide annual counts of STEM URM transfers.[18] In the funding application, the CFSA identified a baseline of 451 student transfers in STEM baccalaureate programs, which is the median of four years of CHSA student data (2016/17-2019/20; Figure 15).

Figure 15. URM AA Student Transfers to Regional Partners, Baseline



Data were provided from the same regional partner institutions in AY 2021–2022, AY 2022–2023, and AY 2023–2024. Although there was a dip from AY 2022–2023 to AY 2023–2024, the number of transfers remains above the baseline from the prior grant (Figure 16).

Figure 16. URM AA Student Transfer to Regional Partners, Years 1–3



The CFSA sought to achieve a 30% net increase over the baseline. In the funding application, the CFSA identified a baseline of 451 student transfers in STEM baccalaureate programs, which is the median of four years of CHSA student data (2016/17-2019/20). Each year, the alliance exceeded the median. Overall, there was a 41% net increase in URM transfers (*n*=556) during the grant period.

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

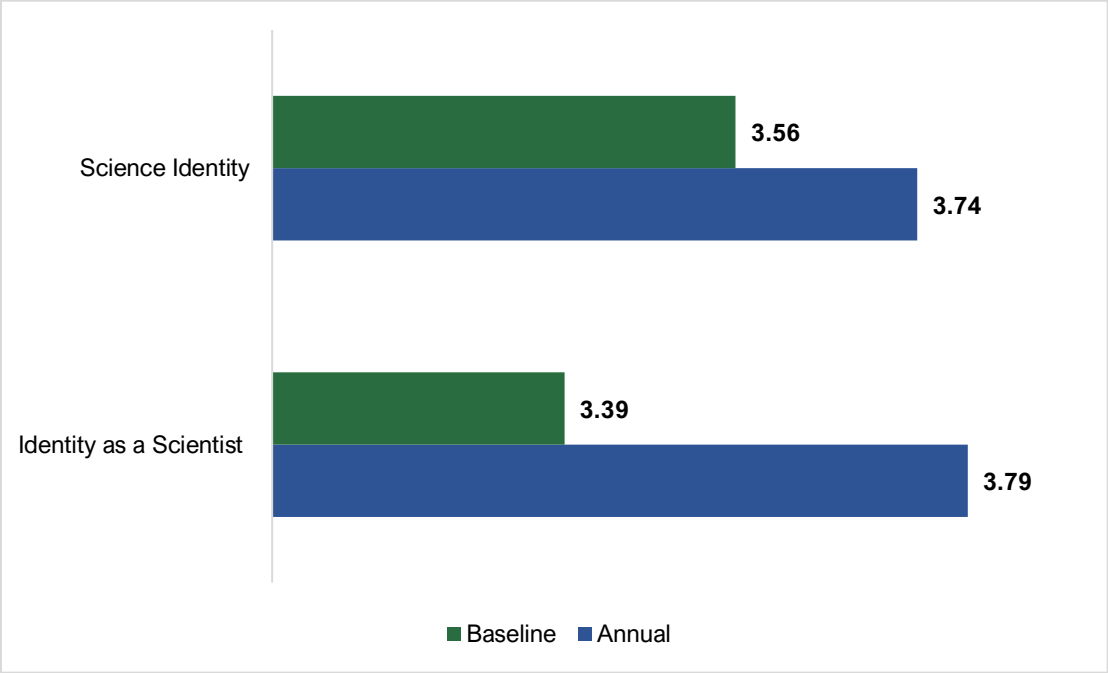
SI.8 was met by the end of the grant, resulting in increases to the average scale scores on the Science Identity Scale and Identity as a Scientist Scale. Belonging in STEM is measured using the science identity scale to assess how strongly an individual feels aligned to a scientist in their most recent research experience. On the baseline survey, 121 LSAMP URM students responded to the survey, reporting an average of 3.56/5 (1 = Strongly disagree to 5 = Strongly agree) on the science identity scale.

A total of 27 URM students completed the annual survey; however, only 21 students responded to the science identity scale. Among those 21 LSAMP URM students, the average science identity rating was 3.74/5. This score indicates that, on average, students agreed that they felt like a scientist.

The identity as a scientist scale assesses how strongly an individual perceives themselves to be a scientist. In the baseline survey, 190 LSAMP URM students responded, reporting an average of 3.39/5 (1 = Strongly disagree to 5 = Strongly agree) on the identity as a scientist scale.

In the annual survey, 26 LSAMP URM students reported an average of 3.79/5 on the identity as a scientist scale. This score indicates that, on average, students perceived themselves as scientists (Figure 17).

Figure 17. Science Identity and Identity as a Scientist Ratings, Baseline to Final (Scale 1-5)



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

SI.9 was partially met by the end of the grant, resulting in increases to the average scale scores on the research self-efficacy sale, confidence as a scientist scale, and commitment to science scale. Although there was a slight decrease on the sources of self-efficacy scale, the average score indicates on average students are in strong agreement that they performed well in their research role.

STEM self-efficacy and identity for LSAMP URM students is measured using the research self-efficacy scale. This scale assesses an individual's ability to perform and persist on eleven tasks related to doing research and earning science undergraduate degrees. On the baseline survey, 219 LSAMP URM students responded, reporting an average of 3.39/5 (1 = No confidence to 5 = Complete confidence) on the research self-efficacy scale (Figure 18). On the annual survey, 27 LSAMP URM respondents reported an average of 3.90/5 on the annual research self-efficacy scale. This score indicates that, on average, students had a lot of confidence in their abilities.

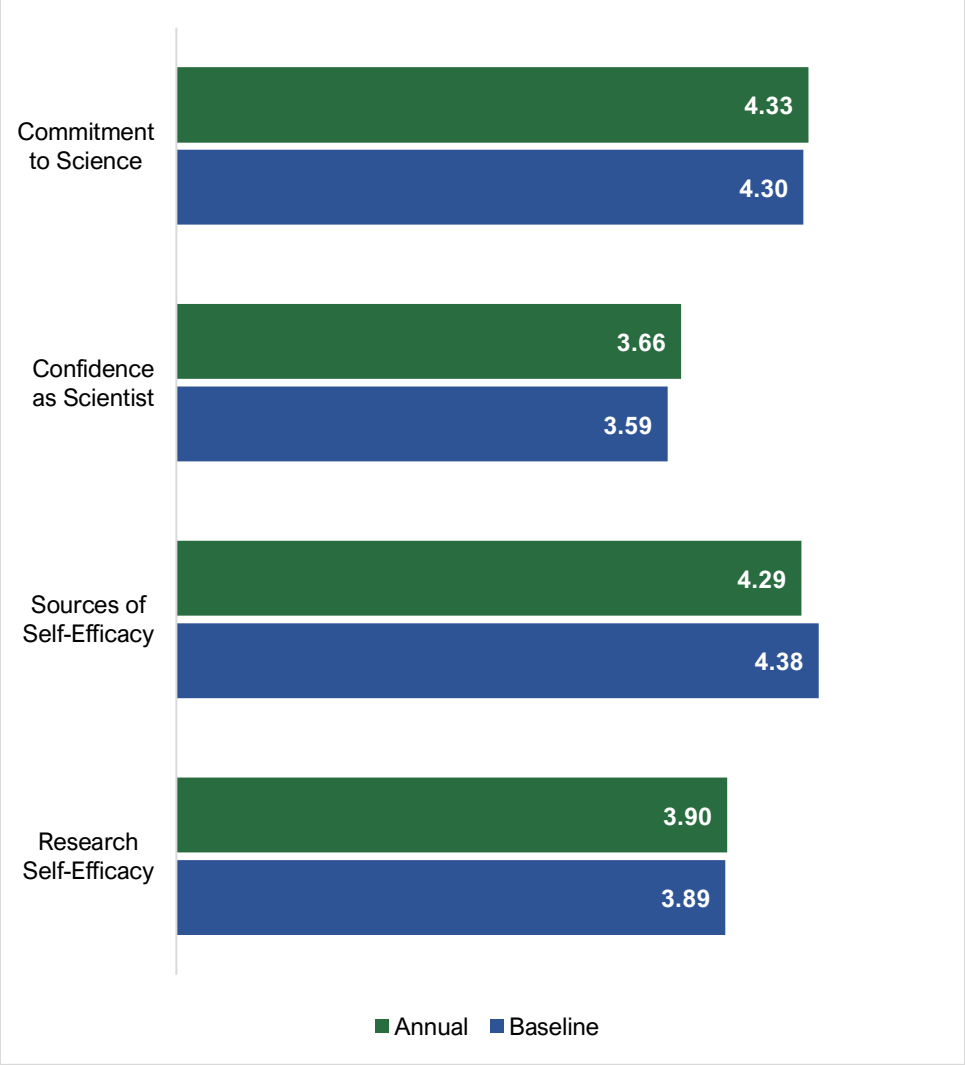
The sources of efficacy scale assesses an individual's performance accomplishments, vicarious learning, social persuasion, and affective/emotional arousal. On the baseline survey, 211 LSAMP URM students responded, reporting an average of 4.38/5 (1 = Not well at all to 5 = Extremely well) on the sources of self-efficacy scale (Figure 18). On the annual survey, 26 LSAMP URM respondents reported an average of 4.29/5, which indicates that, on average, students were in strong agreement and felt they performed very well in their research roles.

The confidence as a scientist scale assesses an individual's confidence in their abilities to function as a scientist. Overall, 189 LSAMP URM students responded to the baseline survey, reporting an average of 3.59/5 (1 = Not at all confident to 5 = Absolutely confident) on the

baseline confidence as a scientist scale (Figure 18). On the annual survey, 26 LSAMP URM respondents reported an average of 3.66/5 on the confidence as a scientist scale. This score indicates that, on average, students felt moderately confident in their ability to successfully complete research tasks.

The commitment to science scale assesses an individual's intention to continue a career in science. Overall, 191 LSAMP URM students responded to the baseline survey, reporting an average of 4.30/5 (1 = Strongly disagree to 5 = Strongly agree) on the commitment to science scale (Figure 16). On the annual survey, 26 LSAMP URM respondents reported an average of 4.33/5 on the commitment to science scale. This score indicates that, on average, PHSC students felt a strong commitment to a career in science.

Figure 18. STEM Self-efficacy and Identity Ratings, Baseline to Final (Scale 1–5)



Chapter Four: Conclusions

Conclusions

The Central Florida STEM Alliance Paths to Engagement (CFSA Paths) was supported by Louis Stokes Alliances for Minority Participation (LSAMP) Bridge to the Baccalaureate (B2B) funding from the National Science Foundation (NSF). The final grant term was from August 2021 through June 2024. High-level successes, challenges, and opportunities for sustainability are presented below.

Successes

Overall, successes included the number of students impacted by LSAMP activities, the variety of engagement opportunities offered to students, and student outcomes in STEM sense of belonging and self-efficacy.

Student Recruitment

Alliance partners utilized a variety of strategies to recruit students, resulting in increasing numbers of LSAMP Scholars each year. By the end of the project, 202 LSAMP Scholars had been recruited, an increase from 99 students during Year 1 (Fall 2021). In addition to the official LSAMP Scholars, LSAMP staff at each alliance institution often supported non-LSAMP students as well, through STEM Clubs and advising. Therefore, the reach of LSAMP was likely greater than participant numbers represent.

Of the students identified as LSAMP Scholars, the majority each year identified as Black (29-30%) or Hispanic (42-45%).

Engagement

The grant resulted in over 456 activities being hosted throughout the time period of the grant (August 2021-June 2024). Activities varied from STEM Club meetings, networking events, workshops, conferences, and field trips. Across grant years, the percentage of engagement opportunities being partially or fully planned by students increased from 13% of events (*n*=6) to 62% of events (*n*=126).

STEM Summit was a major engagement opportunity for students that was hosted by the CFSA each spring. Overall, 169 students (potentially duplicated) attended a STEM Summit. In addition to the STEM Summit, students had the opportunity to attend a variety of other conferences. During focus groups, students reported the benefits of being able to attend regional and national conferences, sharing how these experiences supported them in identifying career pathways and networking with others in prospective fields.

The alliance also successfully engaged 83 students in STEM Professionalization activities. The majority of these students participated as Research Scholars (*n*=54). However, the alliance did have students participate as Community Interns and Peer Coaches as well.

Student STEM Identity, Sense of Belonging, and STEM Self-Efficacy

Students reported increased STEM identity, sense of identity, and STEM self-efficacy throughout the project. During the evaluator's annual site visits, students participating in focus groups shared experiences that had helped them realize that they wanted to be someone who had a career in STEM and forming a sense of community within LSAMP with other like-minded students. Survey data indicated growth in students feeling they belonged in STEM at their institution and STEM self-efficacy.

Challenges

There main challenge present throughout the grant was related to department/institution focused fidelity. Specifically, the CFSA prioritized grant activities, focusing on student activities first, then shifting focus to faculty and department/institution focused fidelity. The alliance was working on activities such as developing articulation agreements, STEM degree pathways, and data sharing agreements with university partners. However, none of these were established by the end of the grant.

Opportunities for Sustainability

Several opportunities for sustainability are presented below:

- Although LSAMP will not be continuing on, STEM clubs and advisors can share STEM opportunities with students. These might include events being held through the STEM clubs, but also other events held at the college. Institutions may consider searching through their college's event calendars to see if there are other STEM events occurring that they could share with students.

- Significant progress has been made with providing undergraduate STEM research opportunities across institutions. Although stipends will no longer be available for faculty to serve as research mentors, colleges may be able to incentivize faculty in other ways. In addition, progress was made in developing a list of REUs and supporting students in applying for these opportunities. Institutions may wish to host workshops prior to REU application deadlines to support students in applying for these opportunities as there is no cost to the institution.

Appendices

Appendix A: Evaluation Plan (as originally submitted)[14]

[14] Strikethrough is used to denote anything that was removed from the original plan.

INTRODUCTION

Purpose of Study

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

Project Background

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

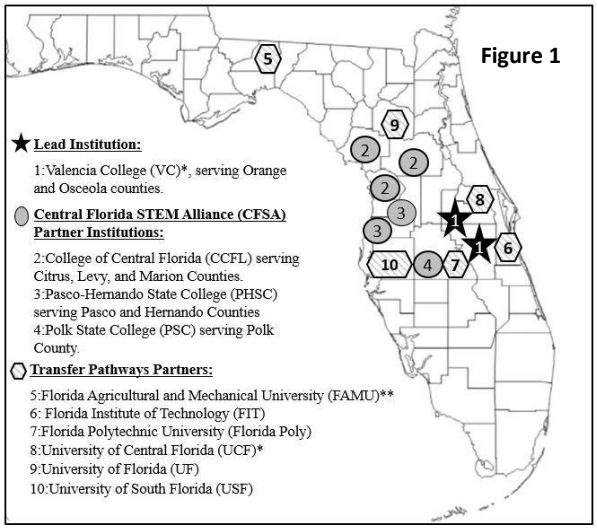


Figure 1

Table A: Credit Program and URM Enrollment in CFSA Comparisons

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

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

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.

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.**15**

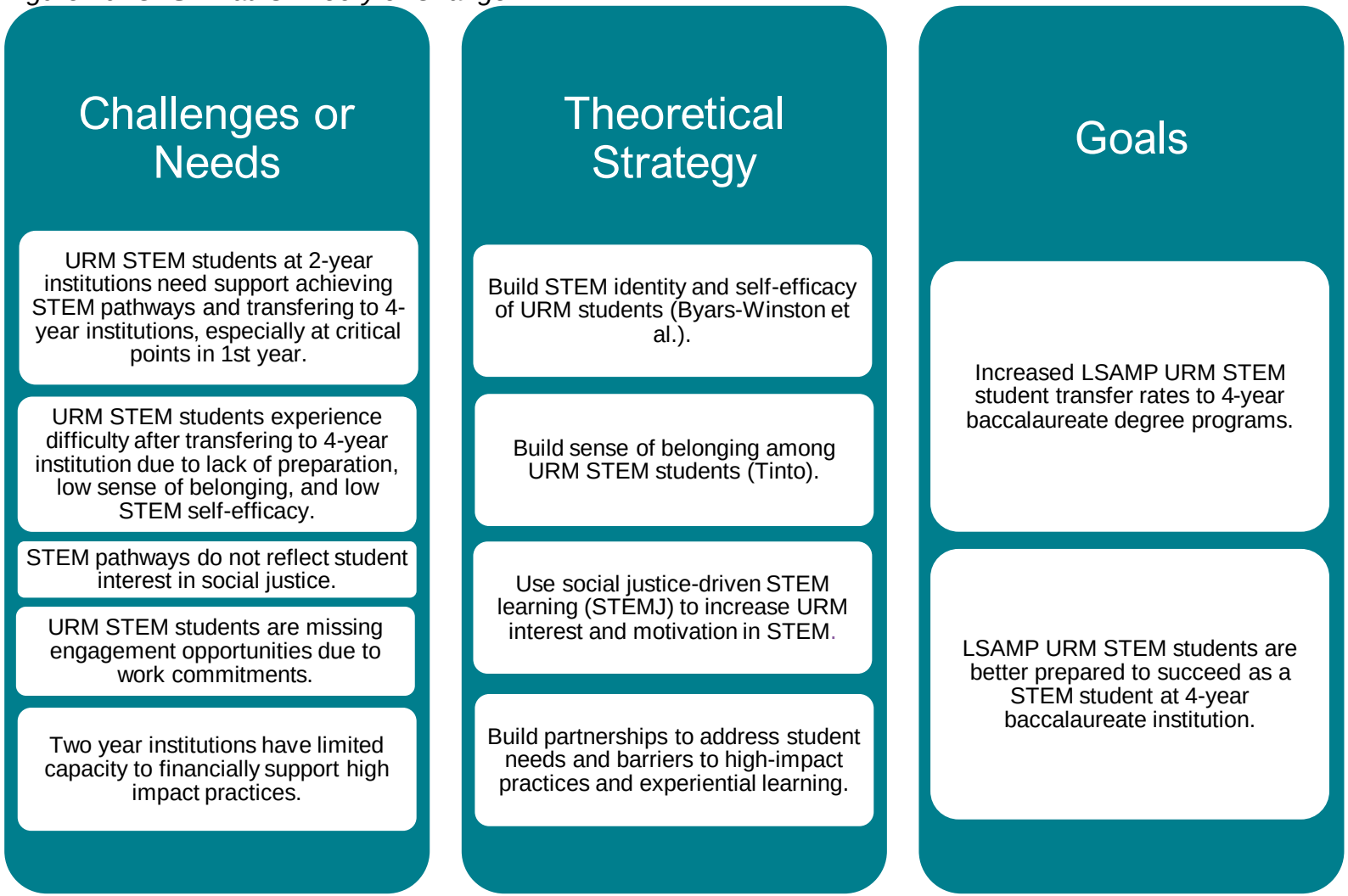
The challenges or needs the program addresses focus on building STEM**16** pathways and supporting transitions to four-year institutions to benefit historically underrepresented minority (URM) students.**17** Contributing to these larger challenges are a lack of preparation, low sense of belonging, low 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).

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

16 "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.

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

Figure 19: 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.**18** 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.

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

Figure 20: CFSA Paths Program Logic Model

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

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

Evaluation Framework

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

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

Process Evaluation

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

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

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

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

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

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

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

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

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

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

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

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

Figure 3: Student Focused Fidelity of Implementation Matrix

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

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

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

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

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

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

Figure 4: Faculty Focused Fidelity of Implementation Matrix

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

Figure 5: Department/Institution Focused Fidelity of Implementation Matrix

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

~~Figure 6: Fidelity Index~~

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

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

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

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

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

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

Figure 7: Process Monitoring Matrix

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

Outcome Evaluation

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

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

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

Were there any unintended outcomes associated with the CFSA project?

Strategic Indicators

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

Figure 8: Strategic Indicators

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

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

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

Goal 1 Strategic Indicators

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

SI.1 Increase in LSAMP URMs declaring a STEM Major

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

Definitions

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

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

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

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

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

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

Definitions

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

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

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

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

Definitions

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

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

SI.4 Increased participation rate in CFSA activities for students

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

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

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

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

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

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

Definitions

Social justice STEM opportunities: Social justice STEM is an approach to STEM learning driven by social justice inquiry and action.**19** 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.

19 Madden et al., 2017.

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, 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.**20**

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.**21**

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

20 Byars-Winston et al., 2016

21 Byars-Winston et al., 2016

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.**22**

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 institutional priorities and contexts.**23** 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.

22 Byars-Winston et al., 2016

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

Supplemental Indicators

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

Figure 9: Supplemental Indicators

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

Quasi-Experimental Design

Design

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

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

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

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

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

Data Collection

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

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

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

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

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

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

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

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

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

Data Analysis

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

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

STUDY PARTICIPANTS & CONSENT

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

Participant Sampling

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

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

STUDY TASKS

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

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

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

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

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

TASK 2: Finalize Evaluation Plan

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

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

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

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

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

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

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

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

TASK 4: Collect Data

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

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

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

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

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

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

TASK 5: Data Analysis and Interpretation of Findings

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

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

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

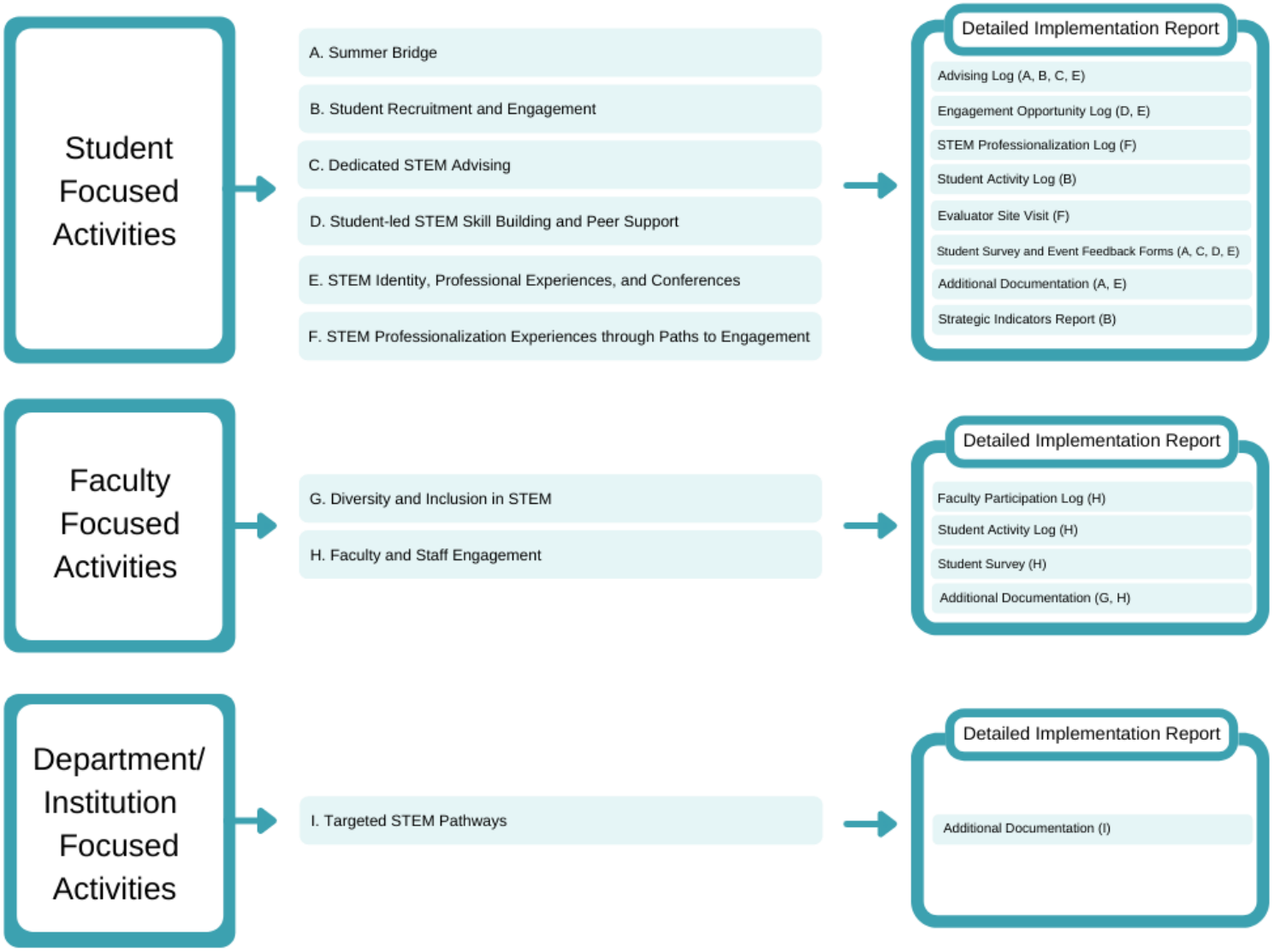
TASK 6: Communication and Reporting

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

DATA COLLECTION

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

Figure 9: Data Collection



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

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

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

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

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

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

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

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

DATA MANAGEMENT & ANALYSIS

Data Analysis

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

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

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

Data Management

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

REPORTING

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

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

APPENDIX A: PROPOSED WORK PLAN

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

Table 1: Year 1 Work Plan

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

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

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

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

APPENDIX B: DATA COLLECTION INSTRUMENTS

Detailed Implementation Report

Central Florida STEM Alliance: Project Implementation Report

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

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

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

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

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

SF 7-9: STEM Identity, Professional Experiences, and Conferences			
Question	**Evidence**	**Required Artifacts**	**Additional Artifacts**
Were on-campus and virtual workshops offered to learn about STEM careers, enhance STEM identity, and expand STEM networks?		• *Engagement Opportunity Log*	
How did your institution promote STEM Student community and support student interaction, workshops, and presentations by STEM professionals?		• *Documentation of promotion (e.g., Newsletter)*	
How did LSAMP team members support students in competing for national research and internship opportunities?		• *Advising Log*	
Did students attend the annual STEM Summit?		• *Roster of STEM Summit attendees*	
How many students attended national STEM conferences?		• *List of students who attended or presented at STEM conferences*	
How did LSAMP team members support students in submitting proposals to national STEM conferences?		• *List of students who attended or presented at STEM conferences* • *Documentation (e.g., workshop fliers, newsletter)*	
Were in-person and virtual lab tours offered in STEM discipline areas at 4-year institutions?		• *List of college and industry tours*	

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

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

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

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

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

Central Florida STEM Alliance
Strategic Indicators Year 1

Institution: **Year:**

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

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

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

Faculty and Student Participation in LSAMP Activities

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

LSAMP Enrollment

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

Advising Log

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

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

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

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

Engagement Opportunity Log

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

Faculty Log

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

STEM Professionalization Experience Log

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

Student Activity Log

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

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

LSAMP Survey Composition

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

Specification Table: Survey

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

Pre-Program Scale	5-12	Science Education					8	2
Pre-Program Scale	13	Science Education						2
Pre-Program Scale	16a-j	Impact of Background on Science Experience					8	
Post-Program Scale: Part 1	1	Preliminary question to determine if question 2 should be asked						
Post-Program Scale: Part 1	2	Value of Financial Support from STEM Professionalization	10.1, 11.1, 12.1					
Post-Program Scale: Part 1	3a-q	Mentoring; understanding how mentoring experiences supported students (narrative support)	6.1, 10.3	2.1		1-3		3
Post-Program Scale: Part 2	1a-j	Confidence as a Scientist					9-10	
Post-Program Scale: Part 2	2a-f	Identity as a Scientist					9-10	
Post-Program Scale: Part 2	3a-g	Commitment to Science					8-10	
Post-Program Scale: Part 2	4-5	Science Education					8	2
Post-Program Scale: Part 2	6a-j	Impact of Background on Science Experience					8	
Program Feedback	1	Preliminary question to determine if question 2 should be asked						
Program Feedback	2a-f	Preliminary question to determine if advising should be atributed to LSAMP						
Program Feedback	2b (i-vii)	Advising Questions						3
Program Feedback	2b(viii)	Overall Satisfaction with Advising	4.5					
Program Feedback	2c-d	Open-ended STEM Academic Adviising				1, 6		
Program Feedback	3	Preliminary question to determine if question 4 should be asked						
Program Feedback	4a-b	Participating as an LSAMP Research Scholar						1
Program Feedback	4c	Monetary Benefits	10.1					

Program Feedback	4d-f	Open-ended Research Scholar questions				1,2,6		
Program Feedback	5	Preliminary question to determine if question 6 should be asked						
Program Feedback	6a-b	Participating as an LSAMP Community Intern						1
Program Feedback	6c	Changes from being a community intern					5	1
Program Feedback	6d	Monetary Benefits	11.1					
Program Feedback	6e-g	Open-ended Research Scholar questions				1,2,6		
Program Feedback	7	Preliminary question to determine if question 8 should be asked						
Program Feedback	8a	Participating as an LSAMP Research Scholar						1
Program Feedback	8b	Monetary Benefits	12.1					
Program Feedback	8c-e	Open-ended Research Scholar questions				1,2,6		
Program Feedback	9a	Connected to Institution					8	
Program Feedback	9b	Connected to Peers					8	
Program Feedback	9c	Connected to STEM					8	
Program Feedback	9d	Build STEM Skills	5.4					
Program Feedback	9e	Build Connections with Peers at my institution	5.2					3
Program Feedback	9f	Build Connections with Peers at other institutions	5.2					3
Program Feedback	9g	Develop Identity in STEM					9-10	
Program Feedback	9h	Explore STEM Careers	7.1					
Program Feedback	9i	Decide on a career path						2
Program Feedback	10	Significant Aspect on Continuing in STEM				10		

LSAMP Baseline Survey/Annual Survey

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

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

Confidentiality and Participation

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

Completing the Survey

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

Consent

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

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

Initial Information

1. Student ID

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

Demographics (Baseline Survey Only)

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

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

Research Self-Efficacy Scale

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

Preliminary Questions to Sources of Self-Efficacy Scale

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

Sources of Self-Efficacy Scale

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

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

Science Identity Scale

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

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

Mentoring

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

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

Confidence as a Scientist

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

Identity as a Scientist

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

Commitment to Science

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

Science Education

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

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

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

Impact of Background on Science Experience

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

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

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

Alumni Survey

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

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

Confidentiality and Participation

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

Completing the Survey

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

Consent

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

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

Initial Information

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

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

Research Self-Efficacy Scale

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

Preliminary Questions to Sources of Self-Efficacy Scale

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

Sources of Self-efficacy Scale

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

Science Identity Scale

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

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

Mentoring

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

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

Confidence as a Scientist

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

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

Identity as a Scientist

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

Commitment to Science

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

Science Education: Current and Future

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

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

Impact of Background on Science Experience

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

Pre-Graduation Survey

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

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

Confidentiality and Participation

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

Completing the Survey

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

Consent

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

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

Initial Information

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

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

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

Research Self-Efficacy Scale

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

Preliminary Questions to Sources of Self-Efficacy Scale

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

Sources of Self-efficacy Scale

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

Science Identity Scale

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

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

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

Mentoring

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

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)
    - 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

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

Science Education: Current and Future

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

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

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

Impact of Background on Science Experience

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

Program Feedback

15. Did you participate in academic advising about STEM during the [semester]?
    - Yes
    - No
16. If Yes to 1:
    - Please provide the name of your STEM advisor.[24]
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree, n/a)
        - My advisor answers my questions.
        - If my advisor does not know the answer to one of my questions, he/she makes the effort to connect me to someone who does.

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

        - The availability of my academic advisor is currently meeting my needs.
        - My academic advisor listens and respects me as an individual.
        - I am given the time I need during my advising appointment(s) and do not feel rushed.
        - My academic advisor is knowledgeable about careers that apply to my major.
        - I would recommend my academic advisor to other students.
        - Overall, I am satisfied with the STEM academic advising I am receiving.
    - What has been most beneficial about your STEM advising experience? (Open ended)
    - Do you have any suggestions for improving STEM academic advising?
17. Were you involved as an LSAMP Research Scholar during the [semester]?
    - Yes
    - No
18. If Yes to 17:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Research Scholar….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - The monetary award provided to LSAMP Research Scholars (Please select all that apply)
        - Allowed me to not hold a job this semester
        - Allowed me to work less hours at my job this semester
        - Helped me stay enrolled in school
    - What is one thing you learned as an LSAMP Research Scholar?
    - What was the most beneficial part of being an LSAMP Research Scholar?
    - What is one improvement that should be made to the LSAMP Research Scholar opportunity?
19. Were you involved as an LSAMP Community Intern during the [semester]?
    - Yes
    - No
20. If Yes to 19:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Community Intern….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - Please indicate your agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)

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

- Has helped me decide on a future career path.

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

Pulse Survey

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

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

Confidentiality and Participation

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

Completing the Survey

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

Consent

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

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

Initial Information

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

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

Program Feedback

3. Did you participate in academic advising about STEM during the [semester]?
    - Yes
    - No
4. If Yes to 3:
    - Please provide the name of your STEM advisor.[25]
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree, n/a)
        - My advisor answers my questions.
        - If my advisor does not know the answer to one of my questions, he/she makes the effort to connect me to someone who does.
        - The availability of my academic advisor is currently meeting my needs.
        - My academic advisor listens and respects me as an individual.
        - I am given the time I need during my advising appointment(s) and do not feel rushed.
        - My academic advisor is knowledgeable about careers that apply to my major.
        - I would recommend my academic advisor to other students.
        - Overall, I am satisfied with the STEM academic advising I am receiving.
    - What has been most beneficial about your STEM advising experience? (Open ended)
    - Do you have any suggestions for improving STEM academic advising?
5. Were you involved as an LSAMP Research Scholar during the [semester]?
    - Yes
    - No
6. If Yes to 5:
    - Please indicate you agreement with the statements below. (1=strongly disagree, 2=somewhat disagree, 3= neither agree nor disagree, 4=somewhat agree, 5 strongly agree)
    - Participating as a LSAMP Research Scholar….
        - Was an enjoyable experience.
        - Made me more interested in pursuing a STEM degree.
        - Made me more interested in pursuing a STEM career.
        - Helped me gain valuable skills I would not have gained otherwise.
        - Provided me with professional connections I would not have gained otherwise.
    - The monetary award provided to LSAMP Research Scholars (Please select all that apply)
        - Allowed me to not hold a job this semester
        - Allowed me to work less hours at my job this semester
        - Helped me stay enrolled in school
    - What is one thing you learned as an LSAMP Research Scholar?
    - What was the most beneficial part of being an LSAMP Research Scholar?

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

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

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

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

Specification Table: Interviews and Focus Groups

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

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

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

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

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

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

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

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

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

LSAMP Faculty/Staff Focus Group Protocol

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

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

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

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

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

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

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

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

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

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

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

STEM Professionalization Experiences

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

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

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

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

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

    a. How have you been involved?

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

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

Student Activities

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

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

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

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

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

Participation in CFSA Work Groups/Implementation Teams

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

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

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

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

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

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

Sustainability

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

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

a. In your opinion, what works in LSAMP?

b. What does not work in LSAMP?

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

LSAMP Student Focus Group Protocol

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

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.

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5. 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 "my advisor."

6. 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.

7. 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.

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

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

The LSAMP Program

2. How did you hear about the LSAMP program?

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

Engagement: Activities

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

4. How has your experience been with LSAMP activities overall?
    a. Probe for: formal activities, informal activities, college/industry tours, STEM Conferences
5. Has participating in the activities been beneficial for you in any way? If so, please explain.
    a. Probe for: interest in STEM careers; sense of belonging; STEM self-efficacy; STEM identity
6. Have you participated in any activities led by STEM club members? How was your experience with these activities?
7. [Starting in Year 2] Have you participated in any activities led by peer coaches? How was your experience with these activities?
8. Do you have any recommendations about the activities that you have participated in?
9. Are there any activities that you would like to see offered to LSAMP students?

STEM Academic Advising

10. I would now like to talk to you about STEM academic advising. Have any of you participated in STEM advising this year?
11. If you have participated in STEM advising, what has your experience been like?
    a. Do you think having a dedicated STEM advisor is important for LSAMP students?
    b. Do you have any suggestions about STEM advising?
12. If you have not participated in STEM advising, can you tell me why you haven't?
    a. Probe for: knowledge of STEM advisor; knowledge of STEM advising; time; need for STEM advising

Summer Bridge [Starting in Year 2]

13. The next set of questions I'd like to direct to anyone who participated in the Summer Bridge experience for incoming students. Did anyone participate in Summer Bridge? [If any students have participated, direct the following questions to those students]
    a. Tell me about your experience with the Summer Bridge experience. What was your favorite part of participating in the Summer Bridge experience? *This could be people, activities, experiences, or other aspects.*

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

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

STEM Professionalization Experiences [Starting in Year 2]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

    a. Probe for financial incentive.

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

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

Overall Experience with the LSAMP Program

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

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

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

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

22. Is there anything else I should know?

LSAMP Project Staff Focus Group Protocol

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

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

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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:

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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)
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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).

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

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

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

- Student Activity Log: The Student Activity Log will be filled out by project staff and verified by the Project lead. Accurate completion of this log will enable the Project Lead to easily calculate several metrics on the detailed implementation report as this log is aligned with the fidelity matrices. Project staff report on student participation in Summer

Bridge, orientation, and This form is updated throughout the year and submitted each term, with a final, complete (i.e., Fall, Spring, Summer) form submitted at the end of the Summer term.

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

Plans for confidentiality, limited data access, and data disposition:

Data Anonymity/Confidentiality:

At the beginning of surveys and all qualitative data collection, participants will receive written, and for focus groups, verbal assurance that their participation is voluntary, that they can opt out at any time, that their responses will not be reported individually, and that their responses will never be linked to their individual responses. Researchers will combine all participant responses and report them in aggregate form only.

Surveys will not collect any personally identifying information (PII) - such as name of respondents – that could permit disclosure or identification of respondents, directly or by inference. All surveys will be collected online using Qualtrics using the “anonymous response” feature to avoid storing identifiable information such as geo-location or IP addresses. The “anonymous response” setting is compatible with email communication. When both of these features are used together, the online platforms will track which contacts have not yet completed the survey and will send any reminders set up to these contacts, but the researchers will have no visibility to this process and will not be able to tie survey responses to specific email addresses. Data for subgroups with cell sizes lower than 5 will be redacted or suppressed.

For focus group discussions, names will not be asked, and the focus group facilitator will not be provided the names of participants in advance. Audio recordings will be destroyed immediately upon transcription, and the transcriptions will be reviewed to remove any PII prior to analysis.

Limited Access:

Protecting the confidentiality of sensitive data is a priority of the research team. Researchers who are responsible for data collection, analysis, and reporting follows procedures and safeguards that limit access to data to other researchers on her team that are working on this project. Data that are collected by and/or data submitted to the external evaluator are stored in a cloud-based, password protected folder accessible only to assigned analysts. Computers are password protected.

Data Disposition:

Upon completion of the project, the research team will ensure the secure destruction of all data originally provided or collected, employing digital or physical shredding of electronic or physical data.

Privacy of Personal Data and Reuse of Anonymized Data by Others: The Central Florida STEM Alliance (CFSA) colleges’ have policies in place for privacy protections that will be extended to those accessing the project data. All student, faculty, and staff data will be stripped of identifiers and only the PI and Co-PIs will have the identifier key. Colleges have ensured security procedures are followed with increased level of protection through password protected intranet

and hardware storage. Personal data confidentiality is upheld and any data reported or presented will preserve the anonymity of students, faculty, and staff by not revealing identifying characteristics and with the exception of interviews or other data collection procedures within which the participant consents to and authorizes use of their name, voice, photograph, or written words. Colleges offer protection for those involved in the work from any claim that their "intellectual property" harmed a population or misrepresented information, while simultaneously allowing the shared use of the property on a broad scale.

Types of Data, Metadata, and Resources: CFSA Colleges' student information systems will be used to determine baseline data and track and collect data elements for reporting and program improvement analysis. Underrepresented minority students (URM) will be identified. For this project, these students will include African American, Hispanic, Native American, Alaskan Native, Native Hawaiian, and Native Pacific Islander students. Student data elements that will be collected include: student demographics (gender, race/ethnicity), performance, and academic program enrollment and transfer information. Consistent collection of data will allow for the dissemination of accurate and consistent information across the CFSA. Student records are maintained through database management and kept in secure online platform. Data captured is both quantitative (numbers declaring a STEM major, fall-to-fall and fall to spring retention and persistence rates; GPA; and others) and
Qualitative (student interaction with STEM faculty and project support staff; observations of student success through project, exit surveys, post-graduation/alumni surveys). The project team is especially interested in the collection of data on underrepresented minority students to measure sense of belonging, self-efficacy, and development of a STEM identity, as well as the correlation between STEM and social justice (STEMJ) and motivation to persist in STEM pathways. The PI and Co-PI, in collaboration with the college's data collection systems and the external evaluator, will use quantitative and qualitative analytics and application data collected to measure success of the project's outcomes including recruitment and student success strategies.

University partners will provide customized reports on the tracking of URM STEM graduates from the CFSA colleges so that progress will be measured in enrollment at the university, progression in STEM majors and for those who graduate. The Offices of Institutional Research at the expanded university partners will also support data sharing in agreements outlining these activities finalized during the project period. The data gathered can be disaggregated by major, ethnicity, and gender so that additional success strategies can be identified and implemented as needed to improve success of specific student subgroups.

Data Format: Standards for data management and access are administered by the CFSA Offices of Information Technology supporting high quality, progressive academic learning environments including learning technology and alternative delivery. Working collaboratively with these offices are staff members involved in institutional research which provides a secure venue for actively managing college-wide data. The purpose of this function is to contribute data, information, and analysis to the CFSA colleges' culture of inquiry and evidence in support of learning assessment, decision-making, strategic planning, continuous improvement, and mandatory reporting.

The CFSA colleges utilize software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using shared transfer protocols including wide and local area networks, the Colleges use an enterprise-based intranet where folders and files are shared. Research staff access the data from the Colleges' student information system to

create reports and assist the college staff with complex, ongoing research projects and data analysis using various file formats.

Ultimately, these outputs are designed to provide an electronic resource for both internal and external stakeholders. Numerous documents are available that includes aggregated data analyses of success measures relevant to the college communities. Metadata is also embedded in HTML documents on the Colleges' websites.

Policies for Access, Sharing, and Provisions for Appropriate Protection/Privacy: The CFSA Colleges have numerous policies adopted by their respective Boards of Trustees. Policies include those related to the acceptable use of information technology resources which identifies user's rights and responsibilities including liability, privacy and security, and consequences for violations as well as the Colleges' rights and responsibilities including user IDs and passwords, use of information/data, and use of software and hardware. At the CFSA Colleges, other relevant policies may include Academic Freedom, Research by Faculty, Copyright, Information Technology Resources, Computer Hardware and Software, Online Privacy, Access and Security, Student Records, Financial Information Security, Human Resource Record Information, Preservation and Disposal of Records, Notification of Social Security Number Collection and Usage, and Web Standards. Faculty and staff training on held periodically on policies.

CFSA Colleges also follow Family Educational Rights and Privacy Act (FERPA) guidelines, as well as participating in the Institutional Review Board (IRB) process. Under this grant program, deliverables will be made available as Open Educational Resources (OER) such as teaching and learning materials that others may freely use and reuse, without charge.

Policies for Archiving Data, Samples, and Other Research Products for Preservation: The CFSA Colleges have policies on the Preservation and Disposal of Records that includes reference to photographs or microphotographs. Although there is no official policy for maintaining data management and access of supporting documentation for work conducted by faculty or staff, any work performed by the project investigators or other personnel under the NSF grant project will be maintained in a data repository in a secure environment that will be organized appropriately to facilitate adequate search protocols for the legacy data, supported by both digital identification and archived for preservation. In the event project faculty or staff exits the CFSA Colleges, the data, samples, and other research products will be secured and preserved. The lineage of a digital object will be documented. The CFSA will explore archiving and preservation frameworks to determine the most compatible system for the project. This archive and project records will be retained for a reasonable length of time and will follow NSF guidelines. If applicable, open source standards will be made available, describing in detail the capture of data and the collection of meaningful assessment. The project team will make the numbers used for graphs or tables available for others to recreate in comparison of their own data. Primary data will be shared with other researchers. A blind copy of primary student measures will be made available to researchers who are encouraged to include in meta research or who are conducting sets, for example, when a demographic variable is assigned to five or fewer students in the sample they would be removed.

Specifically what will be done with or to the research participants:

Participants will participate in the CFSA activities outlined below -

Central Florida STEM Alliance Activities: Student Focused Activities

LSAMP Focus: Summer Bridge Program

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

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

LSAMP Focus: Student Recruitment & Engagement

LSAMP Student Recruitment & Focused Engagement: CFSA Paths will implement a strategy to recruit and engage all new LSAMP students in workshops and learning opportunities that foster their STEM socialization, professionalization and academic success. All students new to LSAMP will participate in an orientation – either through the summer STEM institute bridge program or through a dedicated orientation offered during the summer, fall and spring semesters. In order to join LSAMP, students must be enrolled at their CFSA institution, and registered as a degree-seeking student with demonstrated intent to major in STEM (non-health sciences). Preference will be given to URM students to ensure that at least 90% of all LSAMP students belong to racially and ethnically minoritized groups. All general LSAMP students will be assigned a designated STEM Advisor. Upon completing orientation and enrollment, students will gain access to participate in LSAMP activities, workshops, field trips and learning experiences. To remain engaged in LSAMP, all LSAMP participants will meet with their advisor at least once and participate in at least 3 LSAMP experiences per enrolled semester. Such experiences might include participation in the STEM summit, peer-led student workshops, presentations led by STEM professionals, college tours, or other learning experiences.

LSAMP Focus: Dedicated STEM Academic Advising

STEM Pathways Advising: In alignment with the advising models at their institutions, dedicated STEM advisors will engage LSAMP students in a) academic planning including establishing an

educational plan and transfer plan, b) identifying and preparing for CFSA engagement opportunities, c) referrals to other departments; d) responding to retention concerns.

LSAMP Focus: Student-led STEM Skill Building & Peer Support

Student-led STEM skill-building workshops and peer supports: LSAMP students, including Peer Coaches and STEM club members, will lead presentations and engagement opportunities for other LSAMP students and the broader STEM community at their institutions. These workshops will be developed and facilitated for students by students and may include a range of topics such as guidance for engaging in undergraduate research, exploration of STEM & social justice issues, resume building advice, or student perspectives on summer REUs. To support student socialization, as well as community building and cultivation of a sense of belonging among URM STEM students, Peer Coaches and STEM club members will facilitate informal support sessions for peers to connect with one another and discuss personal and academic achievements and challenges. Technology will be leveraged as possible to create opportunities for LSAMP students to engage across CFSA institutions.

Peer-led Support: CFSA Paths will increase instructional support for URM students in STEM through peer-led support in online and face-to-face environments. LSAMP peer coaches may help to facilitate peer-led study group activities or mentor LSAMP Scholars in the completion of their research projects. Through general LSAMP and STEM club activities, students may also lead group study sessions, tutoring in STEM subjects or peer-led workshops on guidance for studying and succeeding in STEM courses that support their peers in completion of their coursework.

LSAMP Focus: STEM Identity, Professional Experiences & Conferences

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

STEM Conferences: CFSA Paths will host an annual alliance-wide conference – STEM Summit – for LSAMP students to engage with STEM professionals, learn about STEM transfer options, and support student researchers in presenting their work. CFSA will collaborate with other students, mentors, institutions and community partners throughout the community to facilitate the STEM Summit. CFSA Paths will invite LSAMP students to attend national STEM conferences (see budget justification). LSAMP Scholars will be encouraged and supported to submit applications to present their research at such conferences.

College & Industry tours: CFSA Paths will support college tours to university partners' institutions and offer in-person or virtual lab tours in STEM discipline areas at 4-year research institutions. Students will learn about careers through in-person or virtual STEM tours/field visit experiences with industry.

LSAMP Focus: STEM Professionalization Experiences through Paths to Engagement

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

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

LSAMP Peer Coaches: Students who participate in the LSAMP Scholars or Community Intern Program may apply to mentor/ coach other students in a variety of ways, including serving as peer mentors to students in LSAMP scholars, mentoring community interns, mentoring incoming freshman students, and/or supporting the summer bridge program and mentoring students in their UN SDG projects. As mentors or coaches, these students also lead/develop workshops and other opportunities for their peers. This is a one-semester long experience and students will receive an award of $500 upon successful completion of the program. Mentors/coaches will engage in a minimum of 40 hours of peer support, attend cohort meetings, and will create a capstone presentation showcasing their STEM Story and present these at the LSAMP Showcase.

Expected outcome/ how research findings will be used

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

Other (informed consent, protocols)

Age of participants:

18 or older

Number of participants to be recruited – 200 students total across four campuses: 176 as Community Interns, Research Scholars, and/or Peer Coaches and 24 in other LSAMP experiences.

Special populations targeted: - Underrepresented minority (URM) students

Recruitment process: Students involved in the evaluation study will be LSAMP program members. Students are eligible to be LSAMP members if they are enrolled, degree seeking students with demonstrated intent to major in STEM. Preference is given to URM students.

Designation – I request that this research be considered expedited.

Supervisor sign off (PI)

First name

Last Name

Title/Role

Department/Office

Email

Request and Final signatures: Email and Sign

Central Florida IRB Application

Research question

The purpose of this study is to collect information about the impacts of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on participating college students and faculty affiliated with the College of Central Florida.

Description of the research you will conduct

The purpose of this study is to conduct an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). The evaluation will be conducted as a mixed methods study including both qualitative and quantitative measures. This study is guided by a series of research questions that assess the impacts on participating students, including early exposure to STEM pathways, careers and STEM-related concepts, experiences to foster students' science identities, application of STEM knowledge, participation in and completion of STEM research and internship experiences, and efficacy in ability to do college-level work (particularly but not exclusively in math courses) and intent to transfer after associates degree to a Transfer Pathways Partner school or other four year university program.

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

<u>Process Evaluation</u>

Guiding evaluation questions for monitoring CFSA fidelity of implementation are:

d. To what extent were the key components of the CFSA Paths Activity Framework implemented with fidelity?
e. What was the amount of variation in implementation fidelity?
f. What was the relationship of fidelity of implementation to short-term outcomes associated with student declaration of STEM major, engagement, GPA, motivation, persistence, retention, sense of belonging, STEM identity and self-efficacy, and self-reported preparedness for transfer to baccalaureate?

<u>Outcome/Effectiveness Evaluation</u>

Design

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

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

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

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

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

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

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

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

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

Following the approval of the evaluation plan, identification of a control group, and testing and refinement of data collection instruments, the external evaluator will proceed with data collection across all project years. In-person site visits are expected in years 2 and 3 of this grant.

Location(s) of the project.

College of Central Florida

Benefit to college. Additional justification is needed if the survey/interview is to be administered during class time.

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

Surveys, feedback forms, focus groups, nor interviews will take place during class time.

How you will contact faculty of selected classes, if applicable.

No selected classes are involved. Faculty/staff who are involved with the LSAMP program will be contacted to participate.

Size of survey sample and how the participants will be selected.

200 students total across four campuses: 176 as Community Interns, Research Scholars, and/or Peer Coaches and 24 in other LSAMP experiences. Participants will be 18 years old or older. Students involved in the evaluation study will be LSAMP members. Students are eligible to be LSAMP Members if they are enrolled, degree seeking students with demonstrated intent

to major in STEM. Preference is given to URM students. This IRB only asks for approval for students at Central Florida.

Whether or not data will be confidential and/or anonymous.

Data Anonymity/Confidentiality

At the beginning of surveys and all qualitative data collection, participants will receive written, and for focus groups, verbal assurance that their participation is voluntary, that they can opt out at any time, that their responses will not be reported individually, and that their responses will never be linked to their individual responses. Researchers will combine all participant responses and report them in aggregate form only.

Surveys will not collect any personally identifying information (PII) - such as name of respondents – that could permit disclosure or identification of respondents, directly or by inference. All surveys will be collected online using Survey Monkey or Qualtrics using the "anonymous response" feature to avoid storing identifiable information such as geo-location or IP addresses. The "anonymous response" setting is compatible with email communication. When both of these features are used together, the online platforms will track which contacts have not yet completed the survey and will send any reminders set up to these contacts, but the researchers will have no visibility to this process and will not be able to tie survey responses to specific email addresses. Data for subgroups with cell sizes lower than 5 will be redacted or suppressed.

For focus group discussions, names will not be asked, and the focus group facilitator will not be provided the names of participants in advance. Audio recordings will be destroyed immediately upon transcription, and the transcriptions will be reviewed to remove any PII prior to analysis.

Plans for limited-access data and data disposition.

Limited Access

Protecting the confidentiality of sensitive data is a priority of the research team. The researcher who is responsible for data collection, analysis, and reporting follows procedures and safeguards that limit access to data to other researchers on her team that are working on this project. Data that are collected by and/or data submitted to SEG (external evaluator) are stored in a cloud-based, password protected folder accessible only to assigned analysts. Computers are password protected.

Data Disposition

Upon completion of the project, the research team will ensure the secure destruction of all data originally provided or collected, employing digital or physical shredding of electronic or physical data.

What college resources/services will be needed to complete the request.

LSAMP Project Staff at Central Florida will be responsible for collecting data. In addition to LSAMP Project Staff the Institutional Research office will provide student-level data on degree seeking status, education plan designation, cumulative GPA, graduation records, and transfer application information.

Expected outcome and how research findings will be used.

The purpose of this evaluation is to conduct a comprehensive evaluation of the Study of the Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement (CFSA Paths) project. The evaluation will provide information to

improve the project as it develops and progresses. Information is collected to help determine whether the project is proceeding as planned and whether it is meeting its stated program goals and project objectives according to the proposed timeline.

Consent Forms

Dear Student,

Shaffer Evaluation Group is conducting a study to complete an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). All LSAMP member who are over the age of 18 are eligible to participate.

A sample of students will be asked to participate in a focus group, not to exceed one hour. During the focus group students will be asked about their experiences during the LSAMP program.

You may skip questions or discontinue participation at any time. Your decision to participate or not participate will not affect your participation in this program or your relationships with your project administrators.

All information will be handled in a strictly confidential manner, subject to the disclosure requirements of Florida Sunshine Laws, so that no one will be able to identify you when the results are recorded/reported. All information is subject to the Family Educational Rights and Privacy Act (FERPA) of 1974, which is designed to protect the privacy of educational records.

Your participation in this study is totally voluntary and you may withdraw at any time without negative consequences. To withdraw at any time during the study, simply contact Patricia Moore Shaffer, External Evaluator at patricia@shafferevaluation.com, 703.582.9749 or 1769 Jamestown Road, Suite 117, Williamsburg, VA 23185.

Please feel free to contact Patricia Moore Shaffer at 703.582.9749 if you have any questions about the study. Or, for other questions, contact the Chair of Valencia's Institutional Review Board at irb@valenciacollege.edu.

Documentation of Consent:

o I have read this form and decided that I will participate in the focus group described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time.

o I have read this form and decided that I will not participate in the focus group described above.

Dear Faculty/Staff Member,

Shaffer Evaluation Group is conducting a study to complete an independent evaluation of Valencia College's Louis Stokes Alliance for Minority Participation Bridges to Baccalaureate: Central Florida STEM Alliance Paths to Engagement on college students and faculty affiliated with the four contributing partner organizations (College of Central Florida, Pasco-Hernando State College, Polk State College, Valencia College). All LSAMP member who are over the age of 18 are eligible to participate.

A sample of faculty/staff member will be asked to participate in a focus group, not to exceed one hour. During the focus group faculty and staff will be asked about their experiences with the LSAMP program.

You may skip questions or discontinue participation at any time. Your decision to participate or not participate will not affect your participation in this program or your relationships with your project administrators.

All information will be handled in a strictly confidential manner, subject to the disclosure requirements of Florida Sunshine Laws, so that no one will be able to identify you when the results are recorded/reported. All information is subject to the Family Educational Rights and Privacy Act (FERPA) of 1974, which is designed to protect the privacy of educational records.

Your participation in this study is totally voluntary and you may withdraw at any time without negative consequences. To withdraw at any time during the study, simply contact Patricia Moore Shaffer, External Evaluator at patricia@shafferevaluation.com, 703.582.9749 or 1769 Jamestown Road, Suite 117, Williamsburg, VA 23185.

Please feel free to contact Patricia Moore Shaffer at 703.582.9749 if you have any questions about the study. Or, for other questions, contact the Chair of Valencia's Institutional Review Board at irb@valenciacollege.edu.

Documentation of Consent:

o I have read this form and decided that I will participate in the focus group described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time.

o I have read this form and decided that I will not participate in the focus group described above.

APPENDIX E: DATA MANAGEMENT PLAN

Principal Investigator: Dr. Kathleen Plinske, Valencia College
Co-Principal Investigator: Ms. Eda Davis-Lowe, Valencia College
Co-Principal Investigator: Mr. Reginal Webb, Polk State College
Co-Principle Investigator: Dr. Gerene M. Thompson, Pasco Hernando State College
Co-Principle Investigator: Dr. Allan Danuff, College of Central Florida

Privacy of Personal Data and Reuse of Anonymized Data by Others: The Central Florida STEM Alliance (CFSA) colleges' have policies in place for privacy protections that will be extended to those accessing the project data. All student, faculty, and staff data will be stripped of identifiers and only the PI and Co-PIs will have the identifier key. Colleges have ensured security procedures are followed with increased level of protection through password protected intranet and hardware storage. Personal data confidentiality is upheld and any data reported or presented will preserve the anonymity of students, faculty, and staff by not revealing identifying characteristics and with the exception of interviews or other data collection procedures within which the participant consents to and authorizes use of their name, voice, photograph, or written words. Colleges offer protection for those involved in the work from any claim that their "intellectual property" harmed a population or misrepresented information, while simultaneously allowing the shared use of the property on a broad scale.

Types of Data, Metadata, and Resources: CFSA Colleges' student information systems will be used to determine baseline data and track and collect data elements for reporting and program improvement analysis. Underrepresented minority students (URM) will be identified. For this project, these students will include African American, Hispanic, Native American, Alaskan Native, Native Hawaiian, and Native Pacific Islander students. Student data elements that will be collected include: student demographics (gender, race/ethnicity), performance, and academic program enrollment and transfer information. Consistent collection of data will allow for the dissemination of accurate and consistent information across the CFSA. When possible and to the extent allowable by law, data will be collected from the K-12 system to track students into the respective colleges. Student records are maintained through database management and kept in secure online platform. Data captured is both quantitative (numbers declaring a STEM major, fall-to-fall and fall to spring retention and persistence rates; GPA; and others) and Qualitative (student interaction with STEM faculty and project support staff; observations of student success through project, exit surveys, post-graduation/alumni surveys). The project team is especially interested in the collection of data on underrepresented minority students to measure sense of belonging, self-efficacy, and development of a STEM identity, as well as the correlation between STEM and social justice (STEMJ) and motivation to persist in STEM pathways. The PI and Co-PI, in collaboration with the college's data collection systems and the external evaluator, will use quantitative and qualitative analytics and application data collected to measure success of the project's outcomes including recruitment and student success strategies.

University partners will provide customized reports on the tracking of URM STEM graduates from the CFSA colleges so that progress will be measured in enrollment at the university, progression in STEM majors and for those who graduate. The Offices of Institutional Research at the expanded university partners will also support data sharing in agreements outlining these activities finalized during the project period. The data gathered can be disaggregated by major, ethnicity, and gender so that additional success strategies can be identified and implemented as needed to improve success of specific student subgroups.

Data Format: Standards for data management and access are administered by the CFSA Offices of Information Technology supporting high quality, progressive academic learning environments including learning technology and alternative delivery. Working collaboratively with these offices are staff members involved in institutional research which provides a secure venue for actively managing college-wide data. The mission of the this function is to contribute data, information, and analysis to the CFSA colleges' culture of inquiry and evidence in support of learning assessment, decision-making, strategic planning,

continuous improvement, and mandatory reporting.

The CFSA colleges utilize software platforms, data structures, and interfaces to exchange data with minimal loss of content and functionality. Using shared transfer protocols including wide and local area networks, the Colleges use an enterprise-based intranet where folders and files are shared. Research staff access the data from the Colleges' student information system to create reports and assist the college staff with complex, ongoing research projects and data analysis using various file formats. Ultimately, these outputs are designed to provide an electronic resource for both internal and external stakeholders. Numerous documents are available that includes aggregated data analyses of success measures relevant to the college communities. Metadata is also embedded in HTML documents on the Colleges' websites.

Policies for Access, Sharing, and Provisions for Appropriate Protection/Privacy: The CFSA Colleges have numerous policies adopted by their respective Boards of Trustees. Policies include those related to the acceptable use of information technology resources which identifies user's rights and responsibilities including liability, privacy and security, and consequences for violations as well as the Colleges' rights and responsibilities including user IDs and passwords, use of information/data, and use of software and hardware. At the CFSA Colleges, other relevant policies may include Academic Freedom, Research by Faculty, Copyright, Information Technology Resources, Computer Hardware and Software, Online Privacy, Access and Security, Student Records, Financial Information Security, Human Resource Record Information, Preservation and Disposal of Records, Notification of Social Security Number Collection and Usage, and Web Standards. Faculty and staff training on held periodically on policies.

CFSA Colleges also follow Family Educational Rights and Privacy Act (FERPA) guidelines, as well as participating in the Institutional Review Board (IRB) process. Under this grant program, deliverables will be made available as Open Educational Resources (OER) such as teaching and learning materials that others may freely use and reuse, without charge.

Policies for Archiving Data, Samples, and Other Research Products for Preservation: The CFSA Colleges have policies on the Preservation and Disposal of Records that includes reference to photographs or microphotographs. Although there is no official policy for maintaining data management and access of supporting documentation for work conducted by faculty or staff, any work performed by the project investigators or other personnel under the NSF grant project will be maintained in a data repository in a secure environment that will be organized appropriately to facilitate adequate search protocols for the legacy data, supported by both digital identification and archived for preservation. In the event project faculty or staff exits the CFSA Colleges, the data, samples, and other research products will be secured and preserved. The lineage of a digital object will be documented. The CFSA will explore archiving and preservation frameworks to determine the most compatible system for the project. This archive and project records will be retained for a reasonable length of time and will follow NSF guidelines. If applicable, open source standards will be made available, describing in detail the capture of data and the collection of meaningful assessment. The project team will make the numbers used for graphs or tables available for others to recreate in comparison of their own data. Primary data will be shared with other researchers. A blind copy of primary student measures will be made available to researchers who are encouraged to include in meta research or who are conducting sets, for example, when a demographic variable is assigned to five or fewer students in the sample they would be removed.

Appendix B: Methods for Strategic Indicator Analysis

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

The evaluator intended to determine groups based on engagement with the LSAMP program.[26] However, this design proved challenging as students enter LSAMP at different times and participation varies by semester. The evaluator engaged in an exploratory analysis with some initial strategic indicator data, matching it with implementation data to determine how groups could be formed effectively. It was determined that a "participation score" would need to be calculated to allow the evaluator to control for variation in participation across semester and time as an LSAMP student.

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

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

The total score was summed across activities, advising meetings, and professional activities to create an actual score. In the examples provided in Table 3 below, the student participated in several advising meetings and activities each semester except in Summer 2023 when they only participated in one activity. Each of these meetings and activities counts as 1 point in the

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

participation column. The student also was a Research Scholar in Fall 2023, so they received 4 points in the STEM Professionalization column. This gave the student a total score of 16.

Table 3. Example Scoring

Student ID	Participation Spring 2023	Participation Summer 2023	Participation Fall 2023	STEM Professionalization	Total Score
11111	5	1	6	4	16

The total score was helpful but did not account for the length of time a student was involved in LSAMP throughout the year. If the total score was used, students who had been in LSAMP longer would be marked as having a high level of participation. Therefore, the actual score was then divided by a projected score. The projected score is based off of the semester the student started and the number of activities and meetings the student was projected to engage in over the course of the semester(s). Because students are expected to participate in one advising meeting and three activities per spring and fall semester, this equated to four multiplied by either 1 or 2 to account for the number of traditional academic semesters during which the student had participated in LSAMP. As LSAMP imposes no expectations for summer, projected scores were not calculated for students for the summer semester; however, summer participation was encouraged and student points for participation in student activities, advising sessions, and STEM professionalization experiences during the summer were factored into overall scores.

In the example above, the student was involved in three semesters; however, only the spring and fall semesters carried projected point values. Therefore, the student's projected score was 8. The actual score is divided by the projected score (i.e., 16/18= 2.00) to determine a standardized score for each student. This was then used for analysis.

Quasi-Experimental Design

Design

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

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

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

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

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

Data Collection

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

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

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

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

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

- **Education Plan Designation:** Project Leads will contact the Institutional Research office to obtain an 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).