



KY WV Louis Stokes Alliance for Minority Participation in STEM

2021-2022 Annual Report

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Submitted by

University of Kentucky
Lead Institution

Eli Capilouto, DMD, Sc.D.
Principal Investigator

Kazi Javed, Ph.D. (retired summer 2022)

Lynn Michaluk, Ph.D.

David Miller, Ph.D.

Johné Parker, Ph.D.

Kelly D. Bradley, Ph.D (2022-2023)

Co- Principal Investigators

Report compiled by:

Julie Bradley

Director of Coaching

University of Kentucky

Interim Administrative Lead for KY-WV LSAMP

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Project Personnel

Principal and Co-Investigators	
<p>Eli Capilouto, DMD, ScD Principal Investigator University of Kentucky</p>	<p>elic@uky.edu 101 Main Building Lexington, KY 40506</p>
<p>Kazi Javed, Ph.D. (Retired Summer 2022) Co-Principal Investigator/Campus Coordinator Kentucky State University</p>	<p>kazi.javed@kysu.edu 130 Carver Hall, 400 East Main Street Frankfort, KY 40601</p>
<p>Lynn Michaluk, Ph.D Co-Principal Investigator LSAMP Research Co-Investigator West Virginia University</p>	<p>lynette.michaluk@wvu.edu 329 White Hall Morgantown, WV 26506</p>
<p>David Miller, Ph.D. Co-Principal Investigator/Campus Coordinator West Virginia University</p>	<p>miller@math.wvu.edu PO Box 6310 Morgantown, WV 26508</p>
<p>Johne Parker, Ph.D. Co-Principal Investigator University of Louisville and University of Kentucky</p>	<p>University of Louisville vfjone01@louisville.edu 323 East Chestnut Street Louisville, KY 40202</p> <p>University of Kentucky johne.parker@uky.edu 175 Ralph G. Anderson Building Lexington, KY</p>
<p>Kelly Bradley, Ph.D. (2022-2023) Co-Principal Investigator LSAMP Research Co-Investigator University of Kentucky</p>	<p>kdbrad2@uky.edu 144A Taylor Education Building Lexington, KY</p>

Campus Directors, Campus Coordinators and other personnel by campus	
University of	Eli Capilouto, DMD, ScD

Kentucky	<p>President, University of Kentucky Principal Investigator elic@uky.edu</p> <p>Kelly Bradley, Ph.D. (2022-2023) Chair & Professor, College of Education Co-Principal Investigator LSAMP Campus Co-Director LSAMP Research Co-Investigator University of Kentucky Kelly.bradley@uky.edu</p> <p>Johne Parker, Ph.D. Associate Professor, Engineering Co-Principal Investigator LSAMP Campus Co-Director University of Kentucky john.parker@uky.edu</p> <p>Raul Torres (Separated Oct. 2021) LSAMP Campus Coordinator University Of Kentucky</p> <p>Philemon Johnson (Fall 2021-present) LSAMP Campus Coordinator University of Kentucky philemon.johnson@uky.edu</p> <p>Fara Williams (Separated March 2022) KY-WV LSAMP Alliance Project Director University of Kentucky</p> <p>Julie Bradley (March 2022-present) Director of Coaching, Transformative Learning Interim LSAMP Administrative Lead Interim Research Study PI University of Kentucky julie.bradley@uky.edu</p>
University of Louisville	<p>V. Faye Jones, MD, Ph.D, MSPH Senior Associate Vice President for Diversity and Equity Associate Vice President for Health Affairs/Diversity Initiatives Professor of Pediatrics Vice Chair, Department of Pediatrics - Inclusive Excellence University of Louisville LSAMP Campus Director vfjone01@louisville.edu</p>

	<p>Katrina Elliot Academic Counselor LSAMP Campus Coordinator katrina.elliott@louisville.edu</p>
Western Kentucky University	<p>Charles McGruder, Ph.d. Professor, Physics & Astronomy LSAMP Campus Coordinator Western Kentucky University charles.mcgruder@wku.edu</p>
BCTC	<p>Carlos Yates Associate Professor, Physics LSAMP Campus Coordinator Bluegrass Community and Technical College carlos.yates@kctcs.edu</p>
JCTC	<p>Margot McGowen Assistant Director, Office of Grants & Contracts LSAMP Campus Director margot.mcgowen@kctcs.edu</p> <p>Danielle Sims-Brooks (Separated Fall 2021) LSAMP Campus Coordinator JCTC</p> <p>Brandi Mulligan (Spring 2022-present) Director of Diversity and Inclusion LSAMP Campus Coordinator JCTC brandi.mulligan@kctcs.edu</p>
Centre	<p>Leonard Demoranville Associate Professor, Chemistry LSAMP Campus Coordinator Centre College leonard.demoranville@centre.edu</p>
Kentucky State University	<p>Kazi Javed, Ph.D. (Retired Summer 2022) Professor Co-Principal Investigator Campus Director/Coordinator Kentucky State University kazi.javed@kysu.edu</p>

	<p>Rita Sharma, Ph.D. (Summer 2022-present) Associate Professor of Chemistry LSAMP Campus Director/Coordinator Kentucky State University rita.sharma@ksu.edu</p> <p>Micah Glenn, Ph.D. (Separated May 2022) Coordinator, Board of Operations LSAMP Research Study Social Scientist Kentucky State University</p>
Marshall	<p>Maurice Cooley (Retired Summer 2022) Vice President Intercultural Affairs and Student Affairs LSAMP Campus Director Marshall University cooley@marshall.edu</p> <p>Marcie Simms, Ed.D. (Summer 2022-present) Vice President Intercultural and Student Affairs LSAMP Campus Director Marshall University marcie.simms@marshall.edu</p> <p>David Cartwright Research Associate LSAMP Campus Coordinator Marshall University cartwig@marshall.edu</p>
West Virginia University	<p>David Miller, Ph.D. Professor Co-Principal Investigator WVU LSAMP Campus Director/Coordinator West Virginia University miller@math.wvu.edu</p> <p>Lynn Michaluk, Ph.D Research Assistant Professor Co-Principal Investigator Research Co-Investigator West Virginia University lynette.michaluk@wvu.edu</p>

West Virginia State University	Hannah Payne Director: Center for the Advancement of STEM LSAMP Campus Coordinator West Virginia State University hannah.payne@wvstateu.edu
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Other Key Personnel	
Willie Pearson, Ph.D. Professor, Sociology LSAMP Program External Evaluator Georgia Institute of Technology kingvassie@comcast.net	Mark Pittman LSAMP Financial Manager pittman@uky.edu

Executive Summary

Below is a quick overview and key highlights of information contained in the 2022 KY-WV LSAMP Annual Report.

- There were 928 URM STEM degrees granted in 2020-2021 across all Alliance institutions. This is a 20% increase from the baseline year of this award cycle (770 degrees in 2017-18).
- So far, during this award cycle, 3,407 total URM STEM degrees have been granted across all Alliance institutions.
- There were 3,332 URM students enrolled in STEM degrees in 2020-2021 across all Alliance institutions. This is a 4% increase in the number of URM students enrolled in STEM in from the baseline year of this award cycle (3,199 enrolled in 2017-2018).
- It is estimated that 20% of KY-WV LSAMP participants who graduated in 2021-22 were accepted to graduate and/or professional programs.
- KY-WV LSAMP Scholars made 32 presentations at local, state, national, and international conferences and symposia.
- Preliminary data from member institutions indicates there were 271 KY-WV LSAMP Scholars during 2021- 22.
- The averaged grade point average (GPA) reported by site coordinators across member institutions increased to 3.2 GPA.
- The 2022 KY-WV LSAMP Annual Research Symposium was held virtually on April 9, 2022 with nearly 100 registrants.
- KY WV has set rigorous goals for the 2022-2023 academic year.
- KY WV has shifted their data collection and analysis team to highly trained professionals that specialize in data and analysis.

- KY-WV LSAMP Scholars presented research, published articles, attended conferences, and participated in summer research programs. Select individual accomplishments are listed.

Introduction

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation program (KY-WV LSAMP) is a ten-institution alliance led by the University of Kentucky. Alliance member institutions are as follows: Bluegrass Community and Technical College (BCTC), Centre College, Jefferson Community and Technical College (JCTC), Kentucky State University (KSU), Marshall University, University of Kentucky (UK), University of Louisville (UofL), West Virginia State University (WVSU), West Virginia University (WVU), and Western Kentucky University (WKU). Alliance goals are to create, enhance, and expand programs designed to broaden participation and increase the quality and quantity of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics (STEM) disciplines. The alliance projects the following key outcomes for the third funding period (2018-2023). The first key outcome is to increase URM STEM BS degrees at alliance institutions for a total of 1,900 BS STEM degrees over five years. This will be accomplished by achieving increases in the total alliance enrollment average to 2,800 students, annually, with similar increases in retention, transfer rate, and graduation rates. These increases will yield greater rates in STEM graduate degree applications and enrollment.

Each institution has developed programs consistent with LSAMP goals. Institutions have also, with the help of LSAMP, built sustainable partnerships within campus programs as well as with external (outreach) programs and organizations. Program activities and partnership resources focus on outreach and recruiting, peer mentoring, undergraduate research experiences, research presentation opportunities, summer bridge and transitional programs for entering students, curriculum reforms in “gatekeeper” courses, international experiences, and workshops on professional development and STEM career options.

The **intellectual merit** of the program is the increased knowledge base related to teaching and learning practices for underrepresented students in STEM disciplines, practices for improved recruiting and retention, and the development of improved curriculum materials and practices for STEM disciplines. As Scholars pursue their degrees and participate in program activities, they develop the skills needed to succeed not only in their degree programs, but also in the professional community of their chosen field. They learn the skills necessary to be both leaders and experts. Scholars participate in mentoring on multiple levels from providing mentorship to middle school and high school students to being mentored by world-renowned researchers. In addition to increasing their knowledge and research skills, this multi-level mentoring also helps the Scholars to build excellent professional networks for current and future research, presentation, educational and professional opportunities. Often, the connections made through the LSAMP program guide Scholars to the next opportunity.

The **broader impact** is the increase in URM STEM BS degree production. This will broaden math, science, and engineering participation of underrepresented students from the two Established Programs to Stimulate Competitive Research (EPSCoR) states and surrounding

regions. Because of the skills developed and the connections made through LSAMP, Scholars are uniquely qualified for graduate programs, industry, and government. Once they have received their BS degrees, many participants continue into graduate programs. This will increase the diversification of the STEM workforce and broaden the participation of underrepresented students who seek and earn graduate degrees.

The increase in a skilled workforce has the potential to significantly improve the competitive position of the two states and eventually to improve faculty diversity in STEM fields. In turn, participants will play key roles in educating their respective communities about STEM fields and encouraging younger students to pursue STEM disciplines. The multi-level mentoring gives Scholars a venue for serving as role models for future generations.

In September 2018, KY-WV LSAMP received funding to continue the program. There were successes as well as challenges and trials in 2021-22. May 2020, KY-WV LSAMP was officially awarded funding for the first Bridge to the Doctorate cohort in the alliance. Fall 2020, the KY-WV LSAMP began supporting graduate students in STEM fields at the University of Kentucky. Progress continues to be made to increase the number and credentials of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics disciplines.

Program Goals and Measurable Objectives

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation consists of ten colleges and universities. Of these, there are comprehensive research universities, two historically black colleges and universities (HBCU), regional universities, and two 2-year colleges. Using knowledge learned from past successes paired with lessons learned from past shortcomings, the alliance will continue to increase the number of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics disciplines.

In order to meet program goals of increasing URM STEM enrollments and degrees, KY-WV LSAMP must strive to increase the number of students who participate in program activities and receive program benefits. The increase in program participants (Scholars) should result in a ripple effect that increases the number of students earning STEM degrees not only at the partner institutions, but throughout the entire region including all of West Virginia and Kentucky. This is demonstrated in Figure 1.

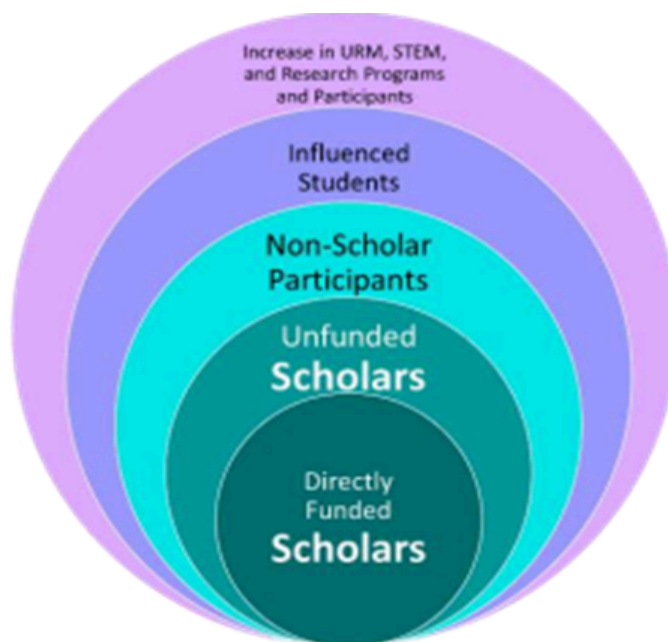


Figure 1: Graphic Representation of the KY WV LSAMP Ripple Effect

Directly Funded Scholars receive direct LSAMP financial support (such as stipends, tuition aid, textbooks, conference travel, etc.) *and* participate in program activities.

Unfunded Scholars do not receive direct LSAMP financial support but are documented as being accepted into the program *and* participating in program activities.

Non-Scholar Participants have not been formally accepted into the program but participate in one or more program activities (such as attending Scholar Meetings or research symposia).

Influenced Students have no direct connection or communication with program staff or participation in program activities but may be influenced and/or mentored by friends and/or family who do. The ending result is an increase in URM, STEM, and undergraduate research programs and participants throughout the alliance and the region.

Updated Data Collection and Analysis Procedures

This year, KY WV LSAMP updated the data collection and analysis methods to ensure accuracy and decrease the potential for human error. Kentucky's Council of Post-Secondary Education (CPE), the West Virginia Higher Education Policy Commission (WVHEPC), and the University of Kentucky's Institutional Research Analytic Decision Support team (IRADS) worked diligently to provide the most up-to-date, accurate reporting of project outcomes based on NSF's definitions of URM students.

Projected Outcome One

To increase URM STEM BS degrees on an average of 380 per year for a total of at least 1,900 degrees over five years.

There were 928 URM STEM degrees granted in 2021-2022 across all Alliance institutions. This is a 20% increase from the first year of this award cycle (770 degrees in 2017-18). So far, during this award cycle, 3,407 total URM STEM degrees have been granted, for an average of 852 per year. Chart one shows URM enrollment in STEM 2014-2015 through 2020-2021. Table one shows enrollment by race.

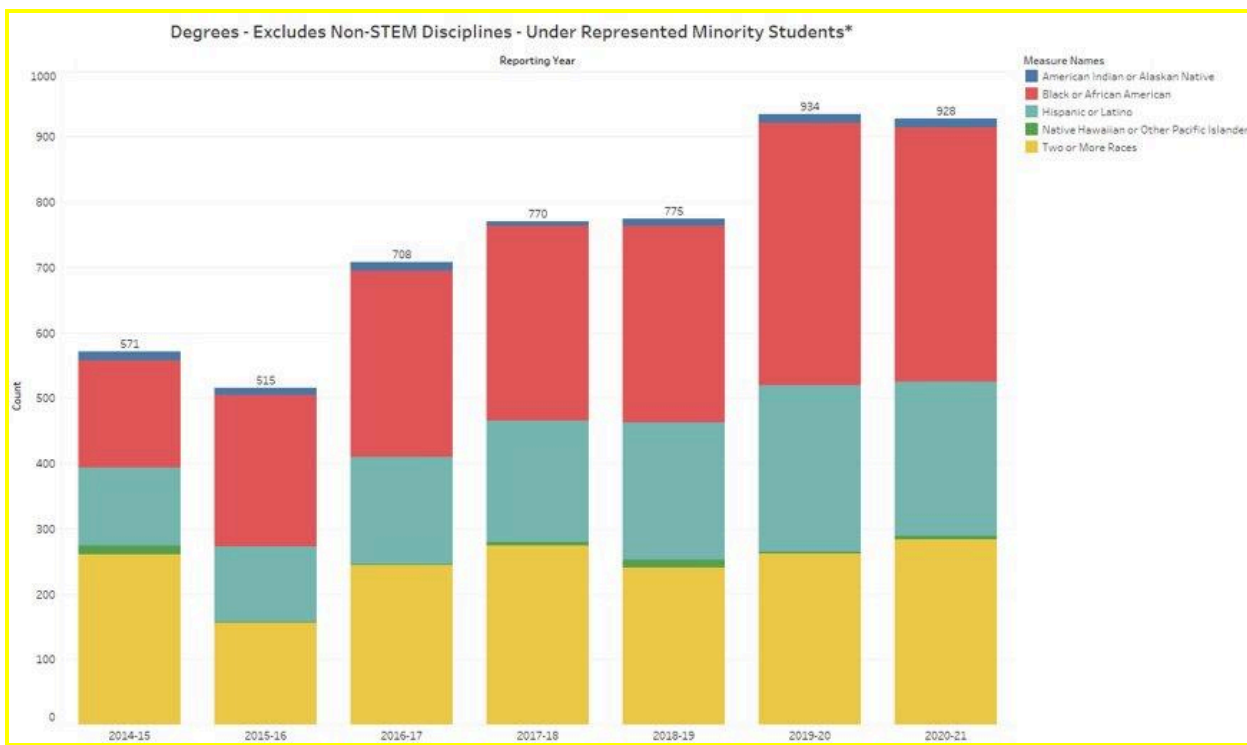


Chart 1: Degrees - Excludes Non-STEM Disciplines- URM

Measure Names	Reporting Year						
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
American Indian or Alaskan Native	13	11	13	6	11	13	14
Black or African American	164	231	295	299	302	401	389
Hispanic or Latino	120	115	165	185	210	255	236
Native Hawaiian or Other Pacific Islander	13	1	1	6	12	3	5
Two or More Races	261	157	244	274	240	262	284

Table 1: Degrees by race.

*Kentucky Council of Post-Secondary Education Definition

Projected Outcome Two

To Increase URM STEM enrollments to an average of 2,800 per year.

There were 3,332 URM students enrolled in STEM degrees in 2020-2021 across all Alliance institutions. This is a 4% increase in the number of URM students enrolled in STEM from the first year of this award cycle (3,199 enrolled in 2017-2018) and an average of 3,284 per year. Chart two shows enrollment from 2014-2021. Table two shows enrollment by race.

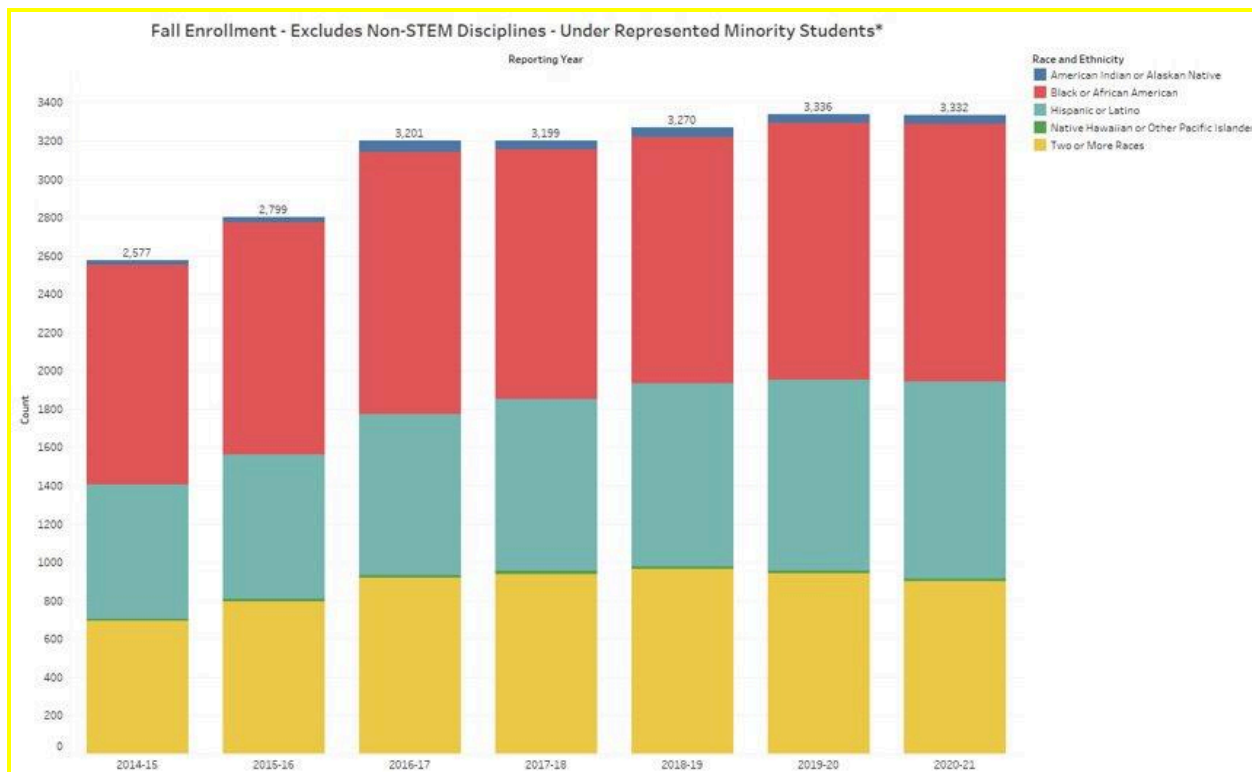


Chart 2: Fall enrollment- excludes non-STEM disciplines- URM students

	Reporting Year						
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
American Indian or Alaskan Native	26	25	61	46	50	43	43
Black or African American	1,147	1,212	1,369	1,305	1,289	1,342	1,349
Hispanic or Latino	700	755	837	891	951	998	1,028
Native Hawaiian or Other Pacific Islander	12	13	15	19	18	12	11
Two or More Races	692	794	919	938	962	941	901

Table 2: Enrollment by race

*Kentucky Council of Post-Secondary Education

Projected Outcome Three

To have at least 50% of graduating LSAMP Scholars be accepted to graduate programs.

Preliminary data for the 2021-22 academic year indicates there were 50 KY-WV LSAMP participants who graduated with STEM bachelor's degrees. Of those students who graduated in the 2021-22 academic school year, consortium institutions reported 10 students (20%) were accepted to graduate and/or professional degrees. Overall, this percentage of graduate school acceptances is a decrease from last year (38%).

Projected Outcome Four

To increase the percentage of LSAMP Scholars who conduct academic research.

As was the case with the previous year, the ongoing pandemic may have impacted KY-WV LSAMP Scholars' ability to conduct research by creating more obstacles than normal for undergraduates to access research opportunities. KY-WV LSAMP member institutions reported 348 KY-WV LSAMP participants in the 2021-22 academic year. These reports also indicated that 41 (12%) of students participating in LSAMP cohorts conducted research during the academic year. This is a decrease from the previous year (17%).

Projected Outcome Five

To increase the percentage of LSAMP Scholars who participate in full-summer internship experiences.

KY-WV LSAMP Scholars are provided opportunities to conduct research during the summer. Some alliance campuses have allocated LSAMP funds to support Scholars to conduct research on their home campus during the summer. Furthermore, KY-WV LSAMP Scholars are informed of and assisted with applying for summer experiences such as Research Experiences for Undergraduates (REU) programs, other college/university programs, national lab opportunities, and industry internships. Preliminary data from member institutions indicates that 46 (13%) Scholars have internships for summer. This is an increase from the previous year (9%).

The KY-WV LSAMP partnership with other LSAMP alliances in order to provide a research exchange program was canceled for 2022 as a result of the ongoing pandemic and other changes in the KY-WV LSAMP consortium during the 2021-22 academic year.

Recommendations for 2022 include providing KY-WV LSAMP participants with the opportunity to conduct research through Knowledge Independence through Externship (KItE) initiative (KItE) in summer 2023.

Projected Outcome Six

To increase the number of documented conference presentations by LSAMP Scholars to an average of 100 per year.

The KY-WV LSAMP consortium encourages (and in some cases, requires) and supports Scholar presentations at local, state, and national conferences and symposia. This goal was previously impacted by obstacles related to the COVID-19 pandemic and continues to reflect those challenges. Many scholars were not able to conduct research in recent years, which has impacted their ability to present research findings. In 2021-22, KY-WV LSAMP member institutions reported that participants made 34 conference presentations. This was an increase from the previous year (13 documented presentations).

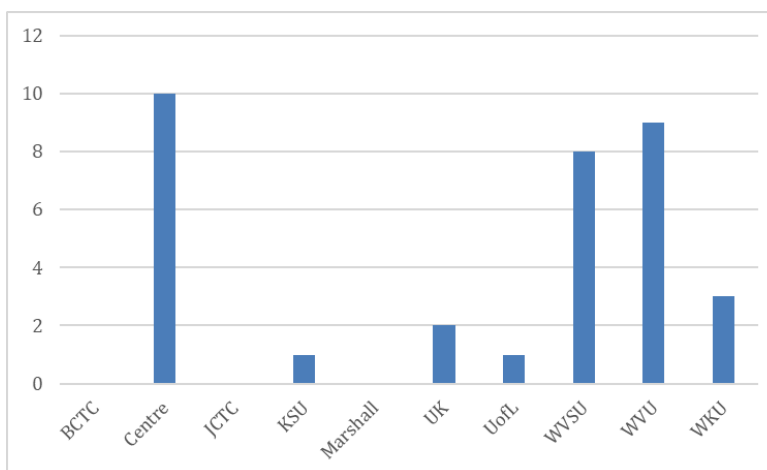


Figure 6: Number of Presentations Made by KY-WV LSAMP Scholars by Institution in 2021-22, as Reported by Member Institutions

Scholars presented at local, state, and national conferences that included, but were not limited to the Kentucky Posters-at-the-Capitol, the West Virginia Research Day at the Capitol, the KY-WV LSAMP Annual Research Symposium, the Society for Industrial and Applied Mathematics (SIAM) Southeastern Atlantic Section Conference, and the Society of Toxicology Conference. Figure 6 shows the breakdown of presentations reported by institution and type. Figure 7 shows a comparison of presentations by academic year.

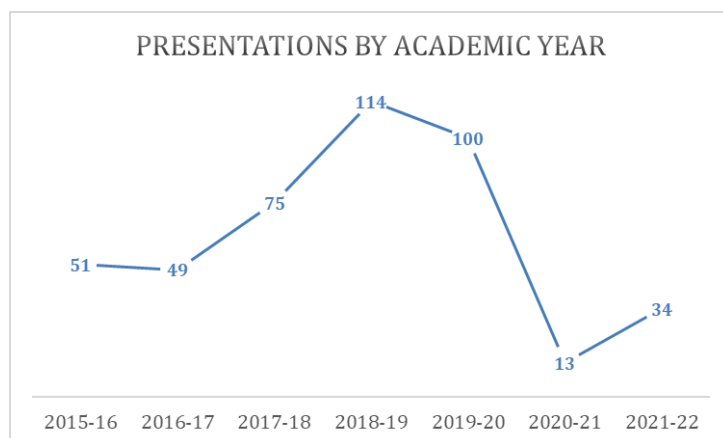


Figure 7: Comparison of Presentations by Academic Year

Projected Outcome Seven

To have at least five LSAMP Scholars per year participate in international research experiences.

In 2017, **Sarah Hodges**, UK graduate, conducted research in Grenoble, France as a participant of the Louisiana international Research Experience for Undergraduates (iREU) program. Through her experience in planning her travel, she developed a checklist for international research travel. This document will help countless future Scholars in planning for and taking advantage of international experiences. Her checklist has already been utilized and updated several times.

International research continued to be impacted by the ongoing pandemic. Beginning Spring 2020, all international travel was canceled, and most member institutions reported that travel restrictions remained in place for 2021-22. The KY-WV LSAMP personnel hope that international research opportunities can resume in the 2022-23 academic year.

Projected Outcome Eight

To increase the average GPA of LSAMP Scholars from 3.1 to 3.3 by year five (2022-2023).

As reported last year, KY-WV LSAMP Scholars' academics, represented by the average GPA, were impacted by challenges related to the ongoing pandemic. However, this figure appears to have rebounded in the most recent academic year. Site coordinators reported the mean GPA of KY-LSAMP scholars at their institutions, which showed an increase in the average GPA

across the consortium this year (3.20) compared to the previous year (2.98). Figure 8 shows the average GPA of KY-WV LSAMP Scholars across member institutions, as reported by site coordinators, from 2014-15 to 2020-21.

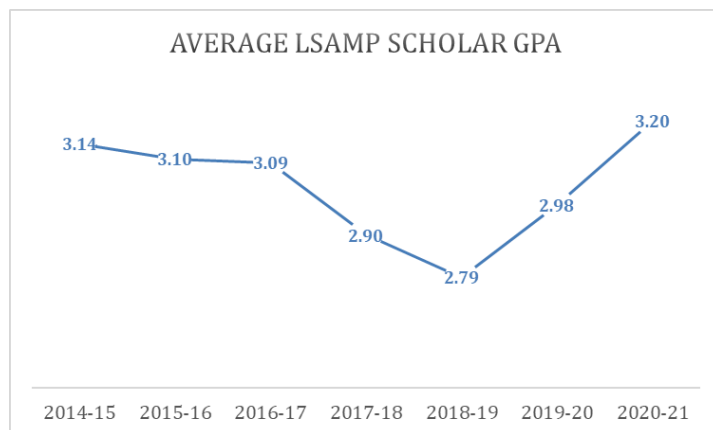


Figure 8: GPA Averages from 2014-15 to 2020-21

Projected Outcome Nine

To increase the number of LSAMP Scholars by at least 5% each year for a minimum of 319 participants in year five (2022-2023).

Preliminary data reported by member institutions for 2020-21 showed that KY-WV LSAMP supported 348 Scholars. This is an increase from the previous year (325 scholars) and is above the goal of 319 participants by 2022-2023 academic year. Figure 9 shows the number of KY-WV LSAMP participants each year. We anticipated these decreases due to personnel, COVID but we have realigned for year 5 with innovative new ideas for marketing and engagement, which include identifying level 1 and level 2 scholars.

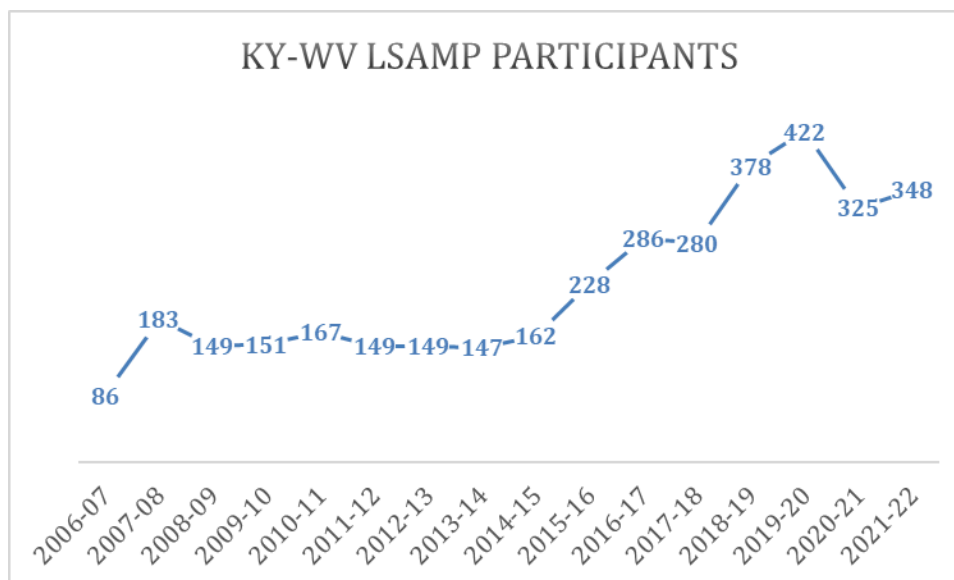


Figure 9: Number of KY-WV LSAMP Participants by Year

Proposed Activities

Scholar Activities

KY-WV LSAMP Annual Research Symposium

The KY-WV LSAMP 14th Annual Research Symposium was originally scheduled as a hybrid event on March 4-5, 2022. However, due to personnel changes, the symposium was changed to an entirely virtual event on Saturday April 9, 2022 and offered in partnership with the UK STEM Through Authentic Research Training (START) program. Like the previous year, Whova was used as the conference platform. Danielle Rosales, Corporate Relations Manager at Space Tango, gave the keynote address.

The 2022 Annual Research Symposium included a panel of KY-WV LSAMP Bridge to the Doctorate Fellows for undergraduate attendees, a panel of LSAMP scholars for the START high school attendees, an Academic Fair with graduate school exhibitors, and research presentations. The University of Kentucky's Aaron West, Alexis Smith, Ariel Robinson, E-Lexus Thornton, and Kai Davis talked about graduate school and their experiences. Marshall University's Ajia Toth, Kaci Cotton, and Pamela Hyde spoke about their collegiate experiences. Exhibitors from Morehouse School of Medicine, Penn State College School of Medicine, University of Alabama at Birmingham's graduate program in Biomedical Sciences, University of Kentucky's graduate program in Biology, University of Kentucky's National Science Foundation Research Traineeship, and Vanderbilt University's School of Engineering participated in the Academic Fair.

There were eleven presentations. Those who presented were:

- · Nolan Abdelsayed, UK Scholar
- · Ella Aponte, Centre Scholar
- · Calvin Covington, Marshall Scholar
- · Alyssa Donawa, UK BD Fellow
- · Abelline Finoah, UK BD Fellow
- · Andrea Hernandez, UK Scholar
- · Michael McLeod, KYSU Scholar
- · Asia Muhammad, KYSU Scholar
- · Peyton Thomas, Marshall Scholar
- · E-Lexus Thornton, UK BD Fellow
- · Rebecca Rudd, UK START Coordinator

The number of registrations and attendees at the event were lower than the previous year. This is likely because of the last-minute changes made to the event date. In total, 92 individuals

registered to attend the event and at least 34 people attended the Welcome/Keynote Address. Additionally, there were 172 visits across the 22 virtual sessions available during the event.

K-12 Mentoring and Connections

Many alliance campuses participate in recruitment events related to mentoring K-12 students. Some examples include:

- Centre College has a student organization called GEMS (Girls in Engineering, Math, and Science) that mentors local middle school students, in which LSAMP Scholars frequently participate.
- Kentucky State University has implemented the Peer-Led Team Learning (PLTL) Program for LSAMP Scholars. Two hour-long workshops are held each week for a total of approximately 30 hours per semester. All scholars receiving stipends are required to attend these workshops.
- At Marshall University, the Health Science Technology Academy (HSTA) provides summer campus-based programming to high school students in order to build a pipeline for disadvantaged and African American students from West Virginia into health science areas of post-secondary education.
- The University of Kentucky's STEM Through Authentic Research Training (START) Program provides opportunities for high school students to conduct research on the University of Kentucky's campus during the summer. LSAMP Scholars and BD Fellows have the opportunity to serve as mentors for the START Apprentices and Ambassadors and to earn a Level 1 College Readiness and Learning Association (CRLA) Peer Educator and Coaching certification by completing the mentor training. To strengthen the partnership between LSAMP and the UK START Program, Molly McAndrew, the START Graduate Teaching Assistant, ran the Spring 2022 UK cohort LSAMP and BD meetings and took over the organization of the LSAMP Research Symposium after this semester's personnel changes. More information on the UK START program can be found at start.uky.edu.
- LSAMP Scholars from West Virginia State University participated in the WVSU STEM Scholar Mentors, a program that provides mentorship to high school students in STEM.

Academic Assistance

All campuses in the alliance offer academic assistance. Some institutions offer connections to campus-wide services and programs such as the LSAMP partnership with the Transformative Learning department at the University of Kentucky, which offers integrated success coaching for LSAMP scholars. Other institutions also offer LSAMP and/or campus-funded tutoring support such as the University of Louisville, which provides LSAMP scholars with REACH tutoring, Academic Support Events and Workshops, in addition to 1-on-1 mentoring. Still, other member schools in the alliance provide the necessary academic materials for students to complete their collegiate studies, such as West Virginia State University, which has a laptop loan program so that students can borrow a laptop to complete their coursework.

Hispanic Student Recruiting and Support

Hispanic students are a rapidly growing demographic in the region. Some alliance campuses have specific programs/initiatives for the Hispanic/Latino communities. For example: UofL has a designated Hispanic recruiter and UK has connections with research mentor, Dr. Isabel Escobar, who targets Hispanic/Latino recruitment for the Society of Hispanic Professional Engineers.

Professional Development and Graduate School Preparation

Attainment of STEM degrees beyond the bachelor's degree is a goal of KY-WV LSAMP. To this point, KY-WV LSAMP provides professional development and support for preparing Scholars to successfully apply for and complete graduate programs, such as the Academic Fair during the KY-WV LSAMP Research Symposium. Member institution site coordinators also reported organizing speakers and providing consultations with research mentors as ways of providing professional development and graduate school preparation.

Transition and Support For Graduate Study

KY-WV LSAMP facilitates participants in applying for graduate fellowships such as the NSF Graduate Research Fellowship Program (GRFP), Sloan Foundation, Ford Foundation, GEM, and Bridge to the Doctorate (BD). Some KY-WV LSAMP campuses also have scholarships and fellowships for graduate study as well. For example, West Virginia University provides assistantships to LSAMP scholars who have been accepted into graduate school with support.

KY-WV LSAMP also hosts BD cohorts at institutions within the alliance. The University of Kentucky is now supporting 13 graduate students. Nine Fellows began participating in program activities Fall 2020. Three Fellows began participating in program activities in April 2021. More details on the Fellows, setting up the program, and the program activities can be found in the BD Annual Report. We are excited to begin this new initiative and anticipate significant increases in recruitment as well as retention of students from underrepresented populations in STEM graduate programs. WVU submitted a proposal in November 2021 for the possibility to host a cohort 2022-2024. Unfortunately, WVU's proposal was not funded.

Internet and Social Media

KY-WV LSAMP strives to increase communications and dissemination of program accomplishments and best practices. The program website has been updated and continues to evolve to include more information and resources for Scholars, program staff, mentors, and faculty across the nation. Features include, but are not limited to, information on each of the partner campuses, important resource links for Scholars and other students, and copies of alliance publications.
<http://www.uky.edu/KYWV-LSAMP/index.html>

The social media profiles for KY-WV LSAMP have been put on hold until 2022-2023. . At that point, the KY-WV LSAMP social media pages will be updated to reflect a better alignment with the anticipated direction of the program based on the external evaluator's suggestions. .

Program Activities

External Evaluation Team

Dr. Willie Pearson, Jr., a prominent and well-respected scholar and evaluator with extended experience in URM STEM education, will continue to serve as the program evaluator. The role of the evaluation team will be to help guide the Alliance to refine and improve the program over time, to advise on best practices in collecting key information without introducing undue administrative record-keeping burden, and to help the leadership team interpret and analyze the evaluations in terms of effective best practices. Dr. Cheryl B. Leggon and others assist Dr. Pearson in evaluating the program.

Institute Advisory Board

The Institute Advisory Board (previously called the Governing Board), composed of the presidents of the KY-WV Alliance Institutions, provides high-level direction for the Alliance. As KY-WV LSAMP PI and lead institution President, Dr. Eli Capilouto communicates with Board members and other key campus administrators to review Alliance progress and reports from the external evaluator to provide relevant guidance and feedback to the Alliance.

External Advisory Board

An advisory board of professionals in higher education as well as research, diversity, and community organizations has been created. Members of the board provide expert advice on program activities and initiatives and represent a variety of backgrounds and experiences. Board members are listed in Table 5. Each year, board members will review the KY-WV LSAMP Annual Report and provide feedback on program activities during a video conference held in the fall. In the spring, board members will be invited to attend the Annual Research Symposium. Board members may also be asked to serve as speakers, critique Scholar research presentations, or volunteer in other capacities.

During the 2021-2022 school year, two of the advisory board members departed from the program. One of the important goals of 2022-2023 is to recruit at least 2 new board members that represent a variety of backgrounds and experiences.

Name	Institution	Discipline/Position	Expertise
Charles Holloway, Ph.D.	Kentucky State University	Vice Provost for Student Success	Diversity and Inclusion
Michael Lauer, Ph.D.	STEAM Academy	Science Teacher	Academic Preparation and Recruitment
Julia Roberts	Gatton Academy	Executive Director	Academic Preparation and

			Recruitment
Jan Tyler	WV EPSCoR	Director	Research Experience and Professional Development

Table One: Members of the External Advisory Board

Links To Affinity Programs

Each campus has unique resources and connections. This includes enhanced collaborations and connections with K-12 institutions and community organizations. Campuses in the KY-WV LSAMP alliance have also been given awards for diversity and other accomplishments. Examples of connections and honors are listed below.

Bluegrass Community and Technical College

BLINKS

BCTC/KSU BLINKS Transfer Enterprise is a transfer collaboration. B is for BCTC, K is for KSU, and LINK is for The Links, Incorporated. The Links, Inc. is one of the oldest and largest volunteer service organizations of women who are committed to enriching, sustaining, and ensuring the culture and economic survival of African Americans and other persons of African ancestry. Students who are selected for the BLINKS Program receive an opportunity to utilize mentoring, study strategies, and other resources to help them be successful at BCTC and to graduate with an Associate of Arts or an Associate of Science degree. After which, if they have a 2.8 GPA or above, they are awarded full tuition to KSU for their undergraduate study. The purpose of the program is to: increase the graduation rate of community college students, increase the number of community college students who transfer to HBCUs, encourage greater collaboration among community colleges and HBCUs, increase the enrollment of selected HBCUs, and increase the graduation rate of students at HBCUs.

Since its beginning, BLINKS has run on mutual promises. However, in Fall 2018, an official MOU was signed by both BCTC and KSU to keep the program going. BLINKS was selected to receive the Access Heritage Award. “This award is granted by the University to an individual / program who has made significant contributions to the equal educational opportunity and institutional access heritage of Kentucky State University.” <http://www.linksinc.org/>
http://bluegrass.kctcs.edu/en/Multiculturalism_and_Inclusion/Blinks.aspx

Latino Leadership and College Experience Camp (LLCEC)

LLCEC is a unique experience that provides Latino and immigrant youth with an intensive college preparation and leadership development experience. Simulating college processes, high school students from across the state of Kentucky are able to enjoy a creative mix of college-like courses, leadership development workshops, team-building activities and social justice awareness. The LLCEC introduces participants to current college students, college professors, community leaders, and an extensive peer network. The close work with professors

allows students to forge healthy and challenging professor/student mentorships that focus on academic success and personal accomplishment.

<https://bluegrass.kctcs.edu/about/student-life/cultural-diversity/latinx-immigrant-outreach/engagement-opportunity-and-support.aspx>

Centre College

The Posse Foundation

The Posse Foundation has partnered with Centre College for over 10 years. It has identified, recruited and trained more than 10,000 public high school students with extraordinary academic and leadership potential to become Posse Scholars. Since 1989, these students—many of whom might have been overlooked by traditional college selection processes—have been receiving four-year, full-tuition leadership Scholarships from Posse’s partner institutions of higher education. Most importantly, Posse Scholars persist and graduate at a rate of 90 percent and make a visible difference on campus and throughout their professional careers.

<http://www.possefoundation.org/>

Centre College has a **commitment to study abroad** experiences. This commitment can be seen in their continued rank in the nation for the number of students who participate in experiences abroad.

Marshall University

A.D. Lewis Community Center

The **A.D. Lewis Community Center** offers a safe environment for the arts, education, recreation and celebration in order to increase opportunities for personal and collective growth. The A.D. Lewis Community Center also employs LSAMP Scholars from Marshall University. <https://www.cityofhuntington.com/city-government/a.d-lewis-community-center/>

University of Kentucky

Center for Academic Resources and Enrichment Services (CARES)

Center for Academic Resources and Enrichment Services (CARES) has a mission to provide a comprehensive academic support system as well as enrichment services to aid in increasing the retention and graduation rates of underrepresented students. Programs and activities assist students in achieving academic excellence and adjusting to student life at the University of Kentucky. Services provided by CARES include: Academic planning through academic progress sessions with a CARES counselor, free tutoring that includes individual tutoring and study groups, assistance with study skills through one-on-one meetings or workshops; and enrichment programs and activities through activities designed to address specific topics at each grade level, i.e. the Critical First Year Program that focuses on topics that range from Understanding Faculty Expectations to Study Abroad Opportunities for first year students, Pathfinders Program that focuses on major exploration and career development for sophomores, and SOAR that focuses on professional and leadership development that enhances career preparedness for juniors and seniors. CARES also hosts the Freshman Summer Program. A University computer lab is also housed at CARES. <http://www.uky.edu/cares/>

Center for Applied Energy Research (CAER)

Center for Applied Energy Research (CAER) serves as a center to answer today's energy questions. Among the most important aims is to assure that the benefits of investigations, research and study are applied, made available to the public and brought into the widest possible use. The Center, through its technology innovation and service to the community, contributes to improving the lives of Kentuckians by creating jobs and economic opportunities; by sustaining vital industries and public services; and by improving energy efficiency and protecting the environment. <https://caer.uky.edu/>

Engineering Broadening Participation Program

Engineering Broadening Participation Program is funded by the National Science Foundation and focuses on mentoring students from underrepresented populations at both the undergraduate and graduate level. Housed at the CAER, the program has three goals: 1) to motivate African American, Hispanic, and Native American students to choose engineering and help them graduate with engineering degrees, 2) to help these students acquire the skills they need to become engineering professionals, academics, leaders, and role models, and 3) to investigate if mentoring in research centers offers advantages over mentoring in traditional engineering departments. Though funding for this program has ended, the connections made during its existence continue to be instrumental in collaborative efforts at UK.

<http://enrg-mentoring.caer.uky.edu/about.html>

National Science Foundation Research Traineeship (NRT) Grant

National Science Foundation Research Traineeship (NRT) Grant will combine graduate student training with cutting-edge research in mine land remediation, water treatment, crop production, and power generation and will help address the need for innovators in food, energy, and water systems.

<https://www.engr.uky.edu/research-faculty/departments/biosystems-agricultural-engineering/graduate/national-science-foundation-graduate-research-traineeship>

Office of Undergraduate Research

Office of Undergraduate Research's mission is to promote high quality, undergraduate student-faculty collaborative research and Scholarship in all disciplines across campus, and to use all available resources to support and advance the research endeavor. This office provides extensive matching assistance as well as support for academic year research, summer research, and presentation opportunities and support including the annual UK Showcase of Undergraduate Research and the National Conference on Undergraduate Research (NCUR). <https://our.uky.edu/>

STEMCats

STEMCats, is a Howard Hughes Medical Institute (HHMI) funded initiative. STEMCats is a pre-Fall freshmen academic, research and professional-development

residential program. This living learning program is intended for first year students who have applied for a STEM major or who are interested in a STEM major plus a small cohort of transfer students from the Bluegrass Community and Technical College. STEMcats is supported by the College of Arts and Sciences, Pharmaceutical Sciences, Physiology, Molecular & Biomedical Pharmacology, and the Division of Natural Sciences at Bluegrass Community and Technical College. STEMcats will make for a smoother transition for first year and transfer students coming to UK.

<https://stemcats.as.uky.edu/stemcats-about-us>

University of Louisville

SROP

The Summer Research Opportunity Program (SROP) directed by the Office of the Executive Vice President for Research and Innovation and the Office of the Provost, provides University of Louisville students, who would like to know more about graduate-level education, with a 10-week research experience in a department that offers graduate degrees. These fellowships will also be available to underserved/under-represented student populations from regional colleges and universities. Mentors will provide students with individualized research projects, and the program will provide group seminars on topics related to research and graduate education. Students should be, preferably, in their sophomore or junior year of study.

<https://louisville.edu/honors/Enrichment-opportunities/undergraduate-research-opportunities.html>

West Virginia State University

NASA WV Space Grant Consortium

The **NASA WV Space Grant Consortium** is a NASA sponsored organization consisting of 12 West Virginia academic institutions and 8 corporate and scientific partners. It is dedicated to building research infrastructure and promoting Science, Technology, Engineering, and Math (STEM) education in West Virginia. <https://www.wvspacegrant.org/>

West Virginia University

Emerging Scholars Program (ESP)

The **Emerging Scholars Program (ESP)** classes at West Virginia University are 100% funded by the institution. The faculty salaries, classroom space, and other needs of the class are provided by WVU at no cost to the LSAMP program.

<https://undergraduateresearch.wvu.edu/research-opportunities/louis-stokes-alliance-for-minority-participation-lsamp/emerging-scholars-program>

Programs on Multiple Campuses

Diversity Officers

On each campus, the LSAMP program has a close working relationship with the **Diversity Offices**. The level of support and partnership varies among institutions but can include financial support for LSAMP Scholars, support for recruitment and retention initiatives, and

partnerships with programs housed under the diversity office. In some cases, the LSAMP program is directly housed under the Diversity Office.

Bucks for Brains

Bucks for Brains began in 1997 when the Kentucky legislature approved a bold plan to reform the state’s system of higher education. The goal was to develop a “seamless, integrated system of postsecondary education strategically planned and adequately funded to enhance economic development and quality of life.” A key component of this reform was the state’s creation of the Research Challenge Trust Fund, a strategic investment in university research designed to create new jobs, generate new economic activity and provide new opportunities for Kentucky citizens. Commonly known as “Bucks for Brains,” the program uses state funds to match private donations, effectively doubling the impact of private investment supporting research in strategically defined areas and planting the seeds for a better future.

Student Support Services (SSS) Program

Student Support Services (SSS) Program is a TRiO program funded by the Department of Education. This program exists on many of the alliance campuses and serves as a partner for recruitment and services to LSAMP Scholars. Funds are awarded to institutions of higher education to provide opportunities for academic development, assist students with basic college requirements, and to motivate students toward the successful completion of their postsecondary education. SSS projects also may provide grant aid to current SSS participants who are receiving Federal Pell Grants. The goal of SSS is to increase the college retention and graduation rates of its participants. <http://www2.ed.gov/programs/triostudsupp/index.html>

Upward Bound and Talent Search

Upward Bound and Talent Search are TRiO programs funded by the Department of Education. These programs are intended for middle school and high school students to prepare them for entrance into and success in college. One or both programs exist on many alliance campuses and serve as a resource for recruiting students to college and the LSAMP program. In addition, there are occasions when LSAMP Scholars serve as volunteers, speakers, and/or summer staff for these programs.

Links with Other LSAMP Alliances and Related Organizations

Knowledge Independence through Externships (KItE)

KY-WV LSAMP has partnered with the University of Texas System LSAMP, the Colorado-Wyoming LSAMP, and the Northeast LSAMP to develop *Knowledge Independence through Externships (KItE)*. KItE is an exchange of program participants who will conduct research during the summer. In 2019, one UK LSAMP scholar (Nicholas Graves) conducted research at the University of Massachusetts, Amherst through the KItE initiative. Nicholas worked in the Wearable Electronics Lab (WELab) under the mentorship of Dr. Trisha L. Andrew. He worked on creating a fabric antenna array and made an all fabric thermometer using conductive threads and conductive PEDOT-CL coating on commercial cotton substrate.

Unfortunately, KItE had to be canceled for summer 2020. KItE was, once again, canceled for 2021 and 2022, but we are planning on and excited to renew this initiative summer 2023.

Louis Stokes Midwest Regional Center of Excellence (LSMRCE)

The KY-WV LSAMP project director serves on an advisory committee for the **Louis Stokes Midwest Regional Center of Excellence (LSMRCE)**. Among other projects, this committee is developing a regional campus coordinator handbook, which will have applications and influence the KY-WV LSAMP campus coordinator handbook.

Operations Manual

A draft operations manual (Campus Coordinator Handbook) will be discussed and a committee will be formed at the Leadership Retreat Summer 2022. This document will help to provide guidance to new campus program staff and to create unity and consistency in program communications and data collection and maintenance. The manual will include information such as suggested program activities, requirements for student program participation, instructions and formats for providing participant data, and much more. When the final draft is complete, the document will be provided to each campus in electronic and print formats.

Participant Tracking and Program Reporting

A draft database of Scholars has been created to track demographics, program participation, and accomplishments via Google Drive. Once finalized, the database will be updated periodically and can be easily edited to store additional information as needed for project evaluation, reports, and dissemination. Templates have been created for quarterly reporting, so information gathered and collected can be more easily documented and be more consistent throughout the alliance. The Scholar database will also be discussed at the retreat Summer 2022.

Quarterly reports are required from each institution. Using a template, coordinators must report on participants (including demographics and academic progress), program activities, and Scholar highlights (such as presentations, publications, honors, and awards). Reports are required to be submitted before invoices will be processed for payment.

Research Study

*The Impact of Non-Traditional Teaching Styles and LSAMP Programs on
Non-Cognitive Factors in URM STEM Student Success*

Past and Current Year Progress

IRB approval for collection of survey data at all participating sites began in 2019. In Spring 2020, an IRB modification was submitted and approved, allowing us to begin conducting semi-structured interviews with a subset of LSAMP Scholar at all participating sites starting in Summer 2020. We also filed a modification in Spring 2020 allowing us to offer participants the

chance to win a \$50 Amazon certificate at each participating institution to increase Scholar participation in surveys, which had been low in previous administrations. Renewal of the overall IRB approval was also obtained, as required in previous years.

In Fall 2021 pre- and post- surveys assessing non-cognitive factors associated with academic success were administered. A total of 112 responses were obtained for non-cognitive pre-test surveys and 74 post-test surveys in Fall 2021. However, a change in LSAMP leadership at UK caused a delay in the distribution of the surveys in Spring 2022, and they were not administered. Although we had planned to interview Scholars in the Spring semester, that did not happen for the same reason. Micah Glenn, the research faculty member at Kentucky State University, left KSU in Spring 2022.

After the departure of the previous director in March 2022, Julie Bradley, Interim KY-WV LSAMP Administrative Lead, joined the research team and replaced the former director's position as PI on the IRB in April 2022. After reviewing the protocols, it was brought to the research team's attention that distributing Amazon cards proved problematic. In Spring 2021, one student card winner was identified, but she was not paid at this time because the former KY-WV LSAMP Coordinator, Fara Williams, could not determine the appropriate method of distribution. The student's name was added to the list of eight additional students who won Amazon card drawings in Fall 2021. By that time, Ms. Williams had still not determined how to pay selected students. Not for lack of trying: Ms. Williams had communicated with NSF's LSAMP program officer as well as the grant administrator at UK. Based on those meetings, she said she had determined that the best method to distribute would be in-person, when she visited KY-WV LSAMP institutions for her annual visits. However, COVID caused in-person activities to be restricted again, and thus no students have received Amazon cards. IRB approval was suspended for this reason. The IRB Board met on May 13, 2022 and agreed to allow research to resume after we identified 60 winners and attempted to distribute the Amazon cards. This issue has been reconciled and IRB has been updated. We will now continue to administer surveys and conduct interviews. Incentives will continue to be part of the recruitment process.

In May 2022, Dr. Kelly joined the research team to assist in implementation of the research project. Dr. Bradley is now a co-PI on the grant, leading the fiscal management and supporting the research initiative and daily activities.

Overall Progress and Recent Dissemination

Survey and interview data collection and analyses were conducted on data collected to date in 2021, and the research plan timeline was adapted and extended for practical reasons. While the research study experienced many challenges, researchers continued making progress towards goals. One issue that became evident in 2021 is that it is difficult to determine how many scholars are in the KY-WV LSAMP Alliance at any given time, because there is no method used across the alliance to keep track of scholars, and the definition of LSAMP Scholar varies by institution. For example, some Scholars attend LSAMP programs and receive funding, some attend programs and do not receive funding, etc. Funding levels also vary. This made it difficult to determine participant rates across distributions and activities. This weakness was identified during the evaluation and also in journal reviews for manuscripts associated with this work. In response, for the 2022-2023 academic year, site coordinators will carefully track the

number of scholars receiving funding and provide criteria for inclusion and identification of scholars.

The manuscripts below were submitted for publication in 2021 as mentioned in the previous paragraph, but the first one listed was rejected because of the sample size issue. The second was not reviewed when submitted due to an error on the part of the Frontiers in Education journal editors:

Michaluk, L., Glenn, M., Williams, F., Miller, D., Henderson, R., Stewart, J., & Stewart, G. LSAMP scholar's academic motivation, STEM self-efficacy, and other non-cognitive factors important to STEM interest and success.

Michaluk, L., Henderson, R., Williams, F., Glenn, M., Miller, D., Stewart, J., & Stewart, G. A qualitative study of LSAMP Scholars' academic motivation, STEM self-efficacy, and other non-cognitive factors.

In 2022, the second of these two papers was submitted again to the same journal and was accepted, pending approval of requested revisions, currently in-progress. Since the data were obtained prior to the IRB suspension, these data may be disseminated.

The research study publication reports on survey scores and interview responses related to scholars' non-cognitive factors related to academic success including academic motivation, academic STEM self-efficacy, grit, sense of academic belonging in STEM education, STEM academic identity, STEM attitudes, and experiences of racial microaggressions all during the 2020 COVID-19 pandemic. Results show scholars' scores were high on average for most personal non-cognitive factors and some differences between genders were identified. All scholars reported experiencing racial and/or gender microaggressions at their institutions, but not within LSAMP. Detailed qualitative data obtained from text and interview responses showed that scholars' attitudes toward LSAMP were overwhelmingly positive and that LSAMP provided them with a sense of belonging in STEM. Moreover, they reported that LSAMP provided a buffer for them from negative experiences, suggesting that more work needs to be done to prevent such negative experiences of microaggressions and that LSAMP provides students with a support system to improve retention of STEM majors.

No presentations were submitted for review this year. Now that IRB is again active, this will change for the coming year.

Goals for Coming Year

- Distribute Amazon Cards
- Provide excellent recruitment and participation experiences, with identified participants
- Continue to collect survey and interview data from scholars and survey data from a matched sample of STEM students
- Continue to analyze survey and interview data and disseminate results

- Continue revising the research plan as challenges arise

Bridge to the Doctorate

In May 2020, the University of Kentucky received funding to host the first cohort of KY-WV LSAMP Bridge to the Doctorate Fellows. Over the summer, the application and support processes were planned and implemented. Fall 2020 eight Fellows began receiving financial support and participating in program activities. The ninth Fellow began participating in program activities in the fall and began receiving financial support Spring 2021. More details can be found in the BD Annual Report.

Institutional Support And Sustainability Plan

The Alliance plans to continue as a self-perpetuating consortium working to recruit and retain students into undergraduate and graduate STEM programs. Each campus has an institutional commitment for the continuation of the program. Examples of this commitment include, but are not limited to: 1) a portion of the former project director's salary (through March 2022) and the financial manager's salary are supported by the UK Office of the President, 2) ESP sections are, and will continue to be, institutionalized with WVU providing the space and salaries for the professors teaching the courses, and 3) Centre has a diversity specialist on its admission team and has scholarship, support service programs, and community-based learning practices to increase recruitment and retention of URM students. In addition, each campus has connections and resources that help LSAMP leverage support for program participants.

The Office of the Vice President for Institutional Diversity at the University of Kentucky provides significant support including, but not limited to administrative support for travel and other tasks and financial support for select activities and purchases such as appreciation gifts. In summer 2020, Dr. Sonja Feist-Price, the VP for Diversity left the university in order to become Provost at the University of Michigan, Flint. Upon her departure, Dr. George Wright was named Interim VP. In Fall of 2021, Dr. Katrice Albert was named as VP of Diversity.

Alliance Organization and Structure

KY-WV LSAMP is a collaboration of many institutions. More importantly, it is a collaboration of many people who work diligently to provide opportunities and support services to program participants. Without the campus directors, coordinators and those who aid them on each campus, KY-WV LSAMP would not progress and increase the number of STEM degrees granted to URM students. Below is a list of program personnel and their LSAMP roles as well as their institution roles. Descriptions of project roles follow. **This chart has been updated by institution with the current and pending changes to personnel as of July 1, 2022.**

Program Personnel	
University of Kentucky	<p>Eli Capilouto, DMD, ScD President, University of Kentucky Principal Investigator elic@uky.edu</p> <p>Kelly Bradley, Ph.D. (2022-2023) Chair & Professor, College of Education Educational Policy Studies & Evaluation Co-Principal Investigator LSAMP Campus Co-Director LSAMP Research Co-Investigator University of Kentucky Kelly.bradley@uky.edu</p> <p>Johne Parker, Ph.D. Associate Professor, Engineering Co-Principal Investigator LSAMP Campus Co-Director University of Kentucky johne.parker@uky.edu</p> <p>Raul Torres (Separated Oct. 2021) LSAMP Campus Coordinator University Of Kentucky</p> <p>Philemon Johnson (Fall 2021-present) LSAMP Campus Coordinator University of Kentucky philemon.johnson@uky.edu</p> <p>Fara Williams (Separated March 2022) KY-WV LSAMP Alliance Project Director University of Kentucky</p> <p>Julie Bradley (March 2022-present) Project Coordinator Director of Coaching, Transformative Learning Interim LSAMP Administrative Lead Interim Research Study PI University of Kentucky julie.bradley@uky.edu</p>

University of Louisville	<p>V. Faye Jones, MD, Ph.D, MSPH Senior Associate Vice President for Diversity and Equity Associate Vice President for Health Affairs/Diversity Initiatives Professor of Pediatrics Vice Chair, Department of Pediatrics - Inclusive Excellence University of Louisville LSAMP Campus Director vfjone01@louisville.edu</p> <p>Katrina Elliot Academic Counselor LSAMP Campus Coordinator katrina.elliott@louisville.edu</p>
Western Kentucky University	<p>Charles McGruder, Ph.d. Professor, Physics & Astronomy LSAMP Campus Coordinator Western Kentucky University charles.mcgruder@wku.edu</p>
BCTC	<p>Carlos Yates Associate Professor, Physics LSAMP Campus Coordinator Bluegrass Community and Technical College carlos.yates@kctcs.edu</p>
JCTC	<p>Margot McGowen Assistant Director, Office of Grants & Contracts LSAMP Campus Director margot.mcgowen@kctcs.edu</p> <p>Danielle Sims-Brooks (Separated Fall 2021) LSAMP Campus Coordinator JCTC</p> <p>Brandi Mulligan (Spring 2022-present) Director of Diversity and Inclusion LSAMP Campus Coordinator JCTC brandi.mulligan@kctcs.edu</p>
Centre	<p>Leonard Demoranville Associate Professor, Chemistry LSAMP Campus Coordinator Centre College leonard.demoranville@centre.edu</p>

Kentucky State University	<p>Kazi Javed, Ph.D. (Retired Summer 2022) Professor Co-Principal Investigator Campus Director/Coordinator Kentucky State University kazi.javed@kysu.edu</p> <p>Rita Sharma, Ph.D. (Summer 2022-present) Associate Professor of Chemistry LSAMP Campus Director/Coordinator Kentucky State University rita.sharma@kysu.edu</p> <p>Micah Glenn, Ph.D. (Separated May 2022) Coordinator, Board of Operations LSAMP Research Study Social Scientist Kentucky State University</p>
Marshall University	<p>Maurice Cooley (Retired Summer 2022) Vice President Intercultural Affairs and Student Affairs LSAMP Campus Director Marshall University cooley@marshall.edu</p> <p>Marcie Simms, Ed.D. (Summer 2022-present) Vice President Intercultural and Student Affairs LSAMP Campus Director Marshall University marcie.simms@marshall.edu</p> <p>David Cartwright Research Associate LSAMP Campus Coordinator Marshall University cartwig@marshall.edu</p>
West Virginia University	<p>David Miller, Ph.D. Associate Professor, Mathematics Co-Principal Investigator WVU LSAMP Campus Director/Coordinator West Virginia University miller@math.wvu.edu</p> <p>Lynn Michaluk, Ph.D</p>

	Research Assistant Professor Co-Principal Investigator Research Co-Investigator West Virginia University lynette.michaluk@wvu.edu
West Virginia State University	Hannah Payne Director: Center for the Advancement of STEM LSAMP Campus Coordinator West Virginia State University hannah.payne@wvstateu.edu
Additional Supports	Willie Pearson, Ph.D. Professor, Sociology LSAMP Program External Evaluator Georgia Institute of Technology kingvassie@comcast.net Mark Pittman LSAMP Financial Manager pittman@uky.edu

Program Staff Roles

Alliance Project Director

Prior to the former director's departure, the director received enrollment and degree data directly from the Kentucky Council on Postsecondary Education (KY CPE) and the West Virginia Higher Education Policy Commission (WV HEPC). This ensures accuracy and consistency in data provided to NSF through the WebAMP system. Each agency was provided a list of NSF CIP Codes. Those codes are used to retrieve data on STEM enrollments and degrees.

Other duties/tasks that continue to be improved include: 1) a database for tracking participant information and activities; 2) continued improvement on the process for collection and maintenance of data to ensure complete accurate information and to make it easier for campus coordinators as well as administration staff; 3) language and ideas for improving the program website; 4) programmatic and documentation ideas for increasing the quality and quantity of program activities and participants on each campus; and 5) planning of the annual alliance retreat for all coordinators and program staff.

Since March 2022, Julie Bradley, Director of Coaching at the University of Kentucky, has been serving as the KY-WV LSAMP Administrative Lead/Project Coordinator. Ms. Bradley, under the direction of University of Kentucky Leadership, has been attending to many of the tasks that the former director was assigned. These tasks include but are not limited to: compiling the annual report, coordinating the Annual Symposium, working with the external evaluator, communicating between the campuses, serving on the research team and assisting the current UK campus coordinator in leading programming for scholars on UK's campus.

Financial Manager

Mark Pittman has been designated as the project financial officer at the University of Kentucky. Mr. Pittman (with help and oversight of the Office of Sponsored Projects) 1) creates the subcontracts for the alliance institutions, 2) processes payment of invoices from the alliance institutions, 3) tracks all expenditures, and 4) provides monthly reports to the PI, UK Co-PI, and project director.

While Mark Pittman remains part of the team, in summer of 2022, Darin Cecil (<https://medicine.uky.edu/users/drceci0>) joined the LSAMP team in a senior fiscal administrative role to support budget critical operations, processing of no-cost extensions, and lead payroll distributions. Entering the final year, this support was needed. Mark Pittman's focus is shifting to reconciliation of the past LSAMP years and supporting processing needs.

Co-PI's, Campus Directors and Campus Coordinators

The program Co-PI's, campus directors and campus coordinators as well as the other faculty and staff who assist them are integral to the mission of KY-WV LSAMP. It is their daily leadership and dedication that keep the program moving forward. KY-WV LSAMP staff are committed to helping participants prepare for, find, and take advantage of opportunities that lead them to become experts in their field.

This summer, Kelly D. Bradley, Ph.D. has joined the team. Dr. Bradley is a Professor and Chair in Educational Policy Studies and Evaluation. She also serves as Program Chair for Research Methods. Her expertise is in methodology, with an emphasis in measurement and evaluation. For the grant, her efforts are concentrated on fiscal leadership and research efforts.

supporting operations. She is excited to join this dynamic and talented team.

<https://education.uky.edu/profile/kelly-bradley/>

On the recommendation of the external evaluator, an attempt to create consistent titles across the programs has been made to decrease confusion of the programmatic roles. The title “campus director” was assigned to those who supervise campus coordinators. Not all campuses have an assigned campus director position. Campus directors are tasked with overseeing and supporting the campus coordinators on their respective campuses. Campus Coordinators are tasked with the day-to-day recruitment and retention of program participants. This includes, but is not limited to: organizing and implementing program activities, communicating with program participants as well as program staff on their campus and throughout the alliance, documenting participant participation, and providing information to program administration for inclusion in alliance reports.

Alliance Activities

Alliance Meetings

Typically, each year, two face-to-face alliance meetings occur. The meetings include: an hour-long meeting during the Annual Research Symposium and a one and a half day Alliance Retreat in the summer. These meetings serve as opportunities for program administration and staff to discuss best practices and programming issues as well as connect as a community. In addition, in the fall, a video meeting is held, and the project director visits each campus. The itinerary for the visits include discussions with campus staff on programming as well as meetings with participants and other campus faculty, staff, and administrators. .

Alliance Retreat

Each year, there is an Alliance Retreat. Given the transition during Summer 2022, the Alliance Retreat is being planned for Fall 2022.

Annual Project Evaluation: External And Internal Review

External Evaluation Report (Inserted upon request)

Each year, the evaluation team visits three of the ten institutions in order to perform focus groups and interviews with LSAMP scholars, faculty mentors, program staff, and campus administration. An electronic survey is distributed to Scholars throughout the alliance. Using data collected through these methods, the evaluation team creates an analysis of the success of the LSAMP program as an alliance. They offer recommendations to improve the program as a whole as well as give quality feedback to the site visit campuses. KY-WV LSAMP will continue to address recommendations made during the previous funding period as well as attend to future recommendations.

Executive Summary

The KY-WV Alliance for Louis Stokes Alliance for Minority Participation (LSAMP) Program ([nsf.gov/lsamp](https://www.nsf.gov/lsamp), 2017), funded by the National Science Foundation, seeks to increase and enhance the participation of underrepresented racial and ethnic minority (URM) populations in STEM academic majors and careers. Specifically, the current funding builds on the previous year, while addressing any unresolved recommendation and the recent COVID-19 campus shutdown.

The most significant themes emerging from this year's site visits: (1) criticality of community building/re-building and networking post-COVID; (2) sharing "promising practices" across sites; (3) Clarify/sharpen definitions of STEM fields (4) Scholars and mentors as recruiters for LSAMP; (5) LSAMP "research" study.

Introduction

Initiatives from the public and private sectors have made some progress to increase and enhance the participation of underrepresented racial minorities (URMs) in science, technology, engineering and mathematics (STEM) fields and careers (BEST, 2004; National Academies, National Academy of Engineering, and National Institute of Medicine, 2011; National Science Board, 2020). Yet, despite the measurable progress of some of these efforts,

African Americans, Hispanics, and American Indians remain underrepresented throughout the STEM education and career pathways.

Moreover, these initiatives have enhanced our understanding of what works—and what does not work—to recruit and retain URMs in STEM. Research and evaluation data provide strong evidence that high quality mentoring and undergraduate research experience are fundamental to develop and implement strategies to recruit and retain URMs in STEM (Adams et al., 2021; Leggon and Pearson, 2010; Chemers et al., 2011; Ghee et al., 2014; Leggon and Gaines, 2017); National Academies, 2020; Sto. Domingo et al. 2019; Hrabowski, Tracy and Henderson, 2020).

This report consists of four sections: [1] Methodology; [2] Findings from site visits; [3] Conclusions; and [4] Recommendations.

Methodology

This report is based on an approach for collection and analysis of quantitative and qualitative data. (Frankfort-Nachmias and Leon-Guerrero, 2015; Babbie, 2014; Berg and Lune, 2012; Khan and Fisher, 2014; National Academies, 2020; Neuman, 2011; Frechtling, 2010). Quantitative information comes from data collected by the sites. Qualitative data come from interviews and focus groups by Zoom of selected LSAMP stakeholders—administrators; faculty; and LSAMP scholars. In past evaluations, quantitative data on Scholar surveys that the evaluation team sent to Scholars after the symposium. In March, the Project Director resigned before administration. Therefore, no survey was administered. Overall, interviews were conducted with 28 subjects, including 16 Scholars, three campus coordinators, two advisory board members and seven mentors.

As was the case last year, all site visits were virtual. The evaluation team in conjunction with the Program Director before leaving selected three site visit institutions on Scholar demographic composition, geographic location, and Carnegie classifications.

Informed consent.

All interviewees were informed of their rights as human subjects and gave verbal consent for interviews to be taped and be transcribed verbatim without personalized identifiers by a third-party professional transcriptionist. Every effort has been made to avoid identification of any partner institution and interviewee, in compliance with the confidentiality agreement. All

subjects gave verbal consent for interviews to be taped; the evaluation team (two experienced evaluators) analyzed the transcripts for critical themes.

Unlike last year, this year sites are anonymized, and findings will be discussed in the context of Institution A, Institution B, and Institution C.

INSTITUTION A

At Institution A, the evaluators conducted four individual interviews (one with the campus coordinator, and three with **mentors**), and one focus group consisting of seven Scholars.

[N=11]

LSAMP goals and objectives.

Both the campus coordinator and research mentors are satisfied with their role in LSAMP and their compensation for that role. The coordinator understands LSAMP's goals and objectives extremely well and knows that it is "geared toward graduate school rather than medicine." The evaluators asked the coordinator to assess the extent to which the goals and objectives of LSAMP are understood by LSAMP stakeholders: research mentors; non-LSAMP administrators; and LSAMP Scholars. The experienced, long-time research mentors understand LSAMP's goals and objectives, they "get the idea". However, the new less-experienced research mentors did not have an orientation and required more briefing on the goals of URM. Non-LSAMP administrators are both aware and very supportive of LSAMP's goals.

There was a consensus among LSAMP Scholars that the goals of LSAMP were to provide opportunities for URMs to conduct undergraduate research and pursue careers in STEM fields. Scholars had an orientation to LSAMP through a meeting with the campus coordinator to learn their responsibilities as an LSAMP Scholar.

Scholars' responsibilities in LSAMP.

Similarly, there was a consensus among Scholars about their responsibilities in LSAMP. The primary focus among interviewees was that Scholars should take advantage of resources to explore potential interests; specifically, making an informed decision about choosing a STEM major and navigating the variety of STEM career pathways. Scholars emphasized the importance of communicating with the LSAMP Director and developing a sense of community

and networks. Scholars agree they should be a role model “representing opportunities for students in STEM” by encouraging students to desire to learn and do their best.

Benefits of participating in LSAMP

Participating in LSAMP provides benefits for research mentors as well as for scholars. Scholars benefit from opportunities that might not be possible otherwise, to develop deeper connections with faculty and to network. Other major benefits are funding, resources, and references to prepare Scholars for graduate school in STEM. The coordinator reported providing Scholars with academic support focused on LSAMP goals and objectives. [Research mentors benefit from being able to identify high quality students to be their research assistants.] However, research mentor interviewees cautioned that although LSAMP’s resources are enough to meet their current goals, LSAMP probably needs more resources so LSAMP scholars do not have to work in the summer and can conduct research.

Challenges

Recruitment and retention.

Because many students have to work during the summer, one of the challenges in LSAMP is recruiting students for summer research. However, there is no problem recruiting mentors for summer research. A major challenge in both recruiting and retaining Scholars is to defeat “the culture of summer research” that makes it difficult to get students to conduct research in the summer; lack of sufficient financial support basically puts Scholars in the position of having to “choose” between conducting research and working in the summer.

COVID 19.

Changes and restrictions due to COVID enhance the challenges to build and sustain a sense of community. Perhaps the primary constraint was having to switch from in-person to virtual interactions. This ended working in laboratories and on-site—and was exacerbated by not knowing how long this transition would last. Interviewees acknowledged the strain this switch put on staff, and commended staff for their efforts. Moreover, both Scholars and research mentors emphasized the negative/destructive impact of COVID on attending in-person Family Night as well as professional conferences. This was a major barrier to take advantage of opportunities to present and participate in STEM conferences and meetings. Replacing in-person

attendance at the LSAMP symposium and other activities was a major obstacle in forming and sustaining connections and collaborations

Benefits of participating in LSAMP.

Key indicators of the impact of participating in LSAMP are Scholars' ratings on selected aspects of their academic performance: preparation to conduct research and preparation to do graduate-level work in STEM courses. On a scale of 1 to 5 [1 = poor; and 5 = excellent] average rating of Scholars on their preparation to do graduate level work in STEM courses was 3.6. It is important to note Scholars' comments: "through participating in LSAMP, I learned to learn," and feel that I am "better prepared than my peers". On the same scale, Scholars rated their confidence in their ability to conduct research 4.3.

Recommendations (Site Interviewees)

- Mentors recommend that students be involved/recruited to LSAMP earlier in the STEM academic pathway—at the pre-college level; high school; or even junior high school. LSAMP should recruit its Scholars in early fall to conduct research for the next summer. Mentors suggested taking Scholars on a tour of graduate schools. This has at least two benefits: enhances Scholars' ability to make important choices in terms of STEM major, and graduate school. In addition, it re-establishes the group experience and sense of community among Scholars.
- Scholars recommend that LSAMP have activities to re-introduce group experiences and develop community.
- Scholars recommend that LSAMP expand mentoring beyond focusing on graduate degrees but should also include professional degrees. Campus Coordinator recommended that mentors' stipend be increased.
- Scholars recommend that someone explain whether Amazon cards were awarded to anyone
- Some *non-racial/ethnic minorities* expressed concern regarding what they described as "inappropriate" or "insensitive" items on the research survey.

INSTITUTION B

At Institution B, the evaluators conducted four interviews [one campus coordinator; three mentors] and one focus group of seven Scholars. N=11

Goals and Objectives

Evaluators asked the campus coordinator to assess the extent to which LSAMP's goals and objectives are understood by key stakeholders: Scholars; Research mentors; administrators; and the campus coordinator.

- **Scholars:** LSAMP Scholars are exposed to LSAMP goals both at their home institution and nationally.
- **Research Mentors:** The campus coordinator was “not sure they [professors] understand the goals”. Consequently, the coordinator plans more outreach to professors.
- **Administrators:** In the coordinator's experience, understanding of LSAMP's goals and objectives varies by level of administrator: the President and Provost “have some general knowledge” ; however, among the other administrators, “not so much.” Nevertheless, it is important to point out as did the coordinator, that the administrators have been very supportive.
- The campus coordinator understands LSAMP's goals and objectives quite well. This was attributed to the deep understanding by working with LSAMP at a national level and “emulating past practices” at successful LSAMP sites.

Evaluators also asked stakeholders about their understanding of LSAMP's goals and objectives.

- **Mentors.** For mentors, LSAMP's goals and objectives center on increasing and enhancing URM diversity in STEM careers and the workforce. Specifically, the focus is on preparing Scholars to be competitive in graduate school, industry, and the STEM job market.
- **Scholars.** For scholars, LSAMP'S goals and objectives concern fostering STEM talent and retention among URMs, and enhancing and increasing opportunities and connections/networking for URMs along STEM education and career pathways. In addition, LSAMP provides opportunities and resources to further STEM career opportunities that normally are unavailable to URMs.

Scholars' responsibilities.

Scholars reported having an orientation to LSAMP each semester. This activity served a dual purpose: as an introduction/re-introduction to LSAMP, its goals, objectives, and opportunities, and as a recruiting tool. Research mentors said that they did not have an orientation. For the

Scholars participating in the focus group, the discussion of their responsibilities as a Scholar focused on service, meetings, and engagement. Specifically, they emphasized their responsibility to engage in community service with local high schools—to provide information and activities to begin to engage high schoolers to think more broadly about opportunities for careers in STEM fields. Focus group participants said they have an obligation to attend conferences. In addition, they say they are required to have an internship as a freshman and to connect with faculty. Other obligations they mentioned include attending conferences and interacting with URM students and faculty inside and outside of their institution.

Greatest Benefits of LSAMP to Scholars.

Two themes ran through Scholars' discussion of the greatest benefits that they derived from LSAMP. The first theme is financial benefits. LSAMP offers a stipend for books, and assistance opportunities to participate in internships and REUs [research experiences for undergraduates]. Not only do these opportunities provide financial assistance, they also provide valuable research experience that can inform career choice and prepare Scholars for STEM careers. Another benefit is financial assistance to Scholars' pursuing graduate studies. The second theme is assistance and counseling. LSAMP provides Scholars with academic assistance including tutoring and training in how to approach concepts. Another major benefit is teaching time management, which Scholars described as being extremely beneficial in balancing work and class. LSAMP staff and mentors can identify resources to provide academic assistance—assistance with course struggles, and counseling on course taking, research experiences, and internships. In addition, LSAMP provides counseling on STEM career options and navigating STEM career pathways; LSAMP provides guidance on how to establish and sustain connections, and networking as an alliance. Finally, LSAMP makes a safe space for asking for help.

In sum, LSAMP provides opportunities and resources for Scholars to prepare for and participate in STEM careers.

Challenges

The scope of benefits coupled with increasing numbers of LSAMP Scholars indicates the need for more resources. Research mentors need more money to cover lab supplies. Conditions provide a special challenge: money is not available until after school starts; consequently,

stipends may be paid at the end of the semester. The campus coordinator needs an assistant and assistance in publicizing LSAMP.

Recruitment.

The campus coordinator describes most of the students in the pool as first-generation students, “loners,” and “STEM nerd persons”. Consequently, they concluded that rather than bombard students with emails, the best recruitment tool is word of mouth. The coordinator has developed a recruitment strategy to use Banner to identify 200 students with a B or better academic average who are eligible for but may be unaware of LSAMP. This more targeted approach is required. According to the campus coordinator, the problem is recruiting teachers to identify students to recruit for LSAMP

Scholars' self-assessments

Evaluators asked scholars to use a scale of 1 to 5 [1= poor; 5= excellent] to rate their research skills, confidence to do research and enhanced confidence to perform well in STEM courses. Scholars' ratings for their research skills varied with the amount of research experience they have already had. The average rating was 2.6. However, ratings among Scholars with research experience were higher than ratings among Scholars without research experience. Similarly, Scholars' ratings of their confidence to do research. 3.7, varied with the amount of research experience they had at the time of the focus group. Scholars who gave a rating of “3” are new students who have not yet had research experience. Finally, the rating for the extent to which participating in LSAMP gave the scholars confidence to perform well in a STEM career was 4.2.

Recommendations (Site Interviewees)

- Start implementation of recruiting students as early as junior high school.
- Use testimonials about research conducted by research mentors and Scholars as a tool to recruit students
- LSAMP research mentors should meet with professors to discuss specific LSAMP program outcomes [e.g., conference presentations, networking]
- Use REUs to link Scholars to the STEM workforce via internships and/or summer jobs.
- Enhance and increase outreach to faculty and forge partnerships with faculty to develop and implement conferences

- Recognize and acknowledge the work of faculty LSAMP mentors and include in their promotion and tenure package
- Recommendations to improve LSAMP should be disaggregated by major [e.g., CS, etc.] and posted on a group message board
- Explain why no one received an Amazon card for completing the research survey

INSTITUTION C

At Institution C, the evaluators conducted interviews with one campus coordinator, two LSAMP mentors, and three scholars. The campus coordinator (a coordinator for a long time), said that the time spent on LSAMP duties reflects the expectations of time outlined in the grant.

LSAMP Goals and Objectives

Evaluators asked the campus coordinator to assess the extent to which LSAMP's goals and objectives were understood by the following stakeholders: LSAMP Scholars; LSAMP mentors; and the campus coordinator. The coordinator said that they create an important bond with the students by personally interviewing every student about their background, why they are interested in LSAMP, and what they want to do in the future. Scholars did have an orientation. Before COVID, the coordinator would schedule an in-person meeting with each research mentor to explain LSAMP's goals and "what we can do and what we can't do." However, with the COVID restrictions that meeting could no longer be in-person. In terms of non-LSAMP administrators, the coordinator gave specific examples of understanding LSAMP's goals and objectives. The university has a new dean whom the coordinator describes as "super pro diversity" and who has a background and understanding of LSAMP from his previous institution. The coordinator thinks that the new dean completely supports LSAMP. The campus coordinator said "the goals and objectives [of LSAMP] are part of my heart."

Kentucky/West Virginia Alliance

In response to the question about how well the Kentucky/West Virginia Alliance functions as an alliance, the coordinator explained: "the first five years were a disaster because the Program Director was totally ineffective...When ___ came on board things turned around." However, with the recent and unexpected departure of the most recent Program Director, this campus coordinator said that they do not know what is going on. The campus coordinator noted the departures of administrators from the alliance led to an influx of interim staff who know the administrative/student services side but do not know the program content." Moreover, "it's very

clear that the Alliance has fundamental problems. Basically, I see that Alliance from my institution's perspective, and "I'm relatively happy with what we are doing at ...I don't have a good feeling of what other institutions are doing, but I know exactly where the money goes at my institution."

Scholars were asked about their understanding of LSAMP's goals and objectives. Overall, their responses focused on research: "get minority students to be able to participate in meaningful research in STEM and go into STEM" careers. Specifically, LSAMP provides "opportunities to get URMs more involved in STEM and find positions across the country".

Scholars discussed their responsibilities in LSAMP.

Primarily, their responsibility was to "better my understanding of what it means to be a student or professional in STEM." Other responsibilities include: getting involved in research with a professor and participating and presenting at professional conferences and meetings. One focus group interviewee described their primary responsibility as an LSAMP Scholar is to "stay on objective for what I'm doing." One student summed up their responsibility as a STEM Scholar, as follows: "to better my understanding of what it means to be a student or professional in STEM."

Scholars' greatest benefits from participating in LSAMP

In general, Scholars said that their responsibility was to "encourage minority students to partake in STEM and research," Among Scholars the greatest benefits from participating in LSAMP are "making connections with all kinds of students in my field" and to "meet my peers and network." Another benefit was that participating in LSAMP provided a stipend to fund my research experience, "funded me to attend and present at conferences and helped me figure out where I'm going." In sum, "it just made everything easier."

Scholars mentioned two least helpful aspects of LSAMP.

First, there was a problem with the agreement to participate in LSAMP insofar as it was unclear on the conditions of the funds, such as whether Scholars can receive financial assistance with the LSAMP stipend. Another least helpful aspect of LSAMP cited was one Scholar's perception that there are "not enough collaborations with other LSAMP students."

Necessary resources [to meet LSAMP goals and objectives]

The coordinator said that the answer a few years ago was that they did not have enough money. However, because of COVID the travel money was used to hire more research assistants.

Compensation

- Coordinator's compensation for the role in LSAMP is a partial summer salary; the coordinator said that they think that this compensation is fair.
- Mentors receive no compensation.

Challenges

- Recruiting:
 - Students. The coordinator explains that recruiting LSAMP scholars has been challenging because “they are not interested in recruiting a large number of students because every LSAMP student at University has to do research...So I recruit students who in my view are very good and who I feel are going to graduate school [because that is the aim of LSAMP].” The problem is that because those students often have independent funding, they question why they need LSAMP.” The coordinator gets a list of top minority students and emails each one.
 - Research mentors. The coordinator reported having no problems with this because “the dean's office supports me.” The coordinator says “I need somebody to support an LSAMP student, and they find me somebody.” The coordinator finds it more effective to work through the dean's office.
- Retention. According to the coordinator, retention has not been much of a challenge because they get students as freshmen or sophomores and keep them in the program until they finish: “I've not kicked anybody out for lack of performance or anything else like that.”
- Travel: Being unable to travel during the 2020-2021 academic year when COVID started posed a major challenge for both Scholars and mentors.

Scholar support

- **Academic:** According to the coordinator, “the reason is because our students are very good and so they don’t require it.” However, when Scholars were asked about their satisfaction with
- **Final support:** Per the coordinator, “they are paid for their research work and their travel is paid.”

Evaluators asked scholars to use a scale of 1 to 5 [1= poor; 5= excellent] to rate them.

Average score:

- Preparation for upper-level course work: 3.5
- Research skills: 4.5
- Ability to do graduate work: 4.0
- Likelihood of applying to graduate school: 4.0
- Likelihood of applying to professional school: 2 of 3 plan to apply for medical school

Evaluators asked scholars to use a scale of 1 to 5 [1= poor; 5= excellent] to rate the

- Extent to which your experience in LSAMP enhanced your confidence to do research? Scholars’ average rating: 4.7
- Extent your experience in LSAMP enhanced your ability to perform well in STEM-related courses. Average rating: 2.8

Status of 2021 Recommendations

- It is recommended that the Alliance and the Symposium pages and social media feature the former Congressman Louis Stokes given his eponymous recognition.
Status: In discussion (See 2022-2023 Goals: Addressing Internal and External Review)
- As was the case last year, Scholars continue to request the disciplinary eligibility criterion be expanded to be inclusive of other related disciplines (e.g., social, behavioral and economic sciences, health, etc.). It recommended that campus coordinators and the Program Director address this perennial issue.

Status: In discussion (See 2022-2023 Goals: Addressing Internal and External Review)

- Re-establish Program Director’s meeting with the lead evaluator in mid- to-late summer to discuss the annual data collection plans

Status: Completed

- Dedicate a session or workshop involving campus coordinators regarding strategies to facilitate more research opportunities for Scholars attending primary teaching institutions. This could involve strategies where grant-recipient researchers at research intensive/extensive institutions seek supplemental funds to provide opportunities for Scholars from underrepresented racial/ethnic minority groups.

Status: Not Implemented

- Scholars complain that there is a need for the Alliance office to send information in a more timely manner to avoid Scholars receiving emails after the deadlines expire. Because this is a recurring complaint, it recommended that the Program Director investigate the matter and determine the extent to which this occurs.

Status: In discussion (2022-2023 Goals: Addressing Internal and External Review)

- Scholars continue to call for in-person Symposia to rotate sites. It is recommended that the Alliance partners revisit the matter because of the potential return of in-person meetings.

Status: In discussion (2022-2023 Goals: Addressing Internal and External Review)

2022 (Evaluator) Recommendations

- Implement actionable strategies to facilitate more inter-institutional interaction beyond the Symposium and Coordinator meeting. This has been a persistent challenge for the Alliance leadership.
- Coordinators across institutions express the need to share ‘promising practices’ regarding strategies to reduce role overload or stress. This has been a persistent challenge for the Alliance leadership.
- The lead evaluator informed the former Program Director that campus coordinators should be informed that under National Science Foundation guidelines social, behavioral, and economic science majors are eligible to participate in LSAMP.
- Mentors called for campus coordinators to reach out to high school teachers to assist in identifying and encouraging LSAMP eligible students to apply.

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- Scholars continue to call for more LSAMP campus visibility, especially during high school student recruitment day and when campus student organizations have booths in the student center or similar venues.
 - The Alliance should do more to build a community of mentors and within and across partner institutions.
 - Consider formally recognizing mentors' contributions by providing letters of support for promotion and tenure as well as merit raises.
 - Inform scholars that LSAMP is funded by the National Science Foundation which does not support efforts to produce professional degrees (e.g., MD, DD, JD, etc.).
 - Scholars continue to report that they do not evaluate LSAMP staff (except through the external evaluators' assessment).
 - A majority of mentors report that they have not undergone formal orientation for LSAMP.
 - Campus coordinators expressed consternation regarding the inadequate communication regarding the status of the management structure of the Alliance following the abrupt resignation of the Program Director. This should be addressed at the forthcoming Coordinators' meeting.
 - There is a need to clarify the composition and role of the research team. Some coordinators were unaware that the former Program Director was not only a member of the research team but actually involved in data analysis and co-authoring papers. There was concern about transparency and a potential conflict of interest. The PIs and Co-PIs or the interim Program Director should address the matter with the institutional representatives.
 - Another potential conflict of interest concerns data reporting. Definition of LSAMP Scholar should be more precise and shared across sites to standardize data reporting practices to make data entry more transparent and avoid artificially inflating counts to show "growth" in the program.
 - Across the three sites, Scholars expressed concern that they were unaware of anyone receiving the promised Amazon cards for completing the research. The PIs and Co-PIs or the interim Program Director should address the matter with the institutional representatives.

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2022-2023 Alliance Goals

The KY WV Alliance is committed to continuous improvement upon the best-practice service to all KY WV LSAMP Scholars, Mentors and Partners. To continue growth and improvement of the program, KY WV LSAMP utilizes both external and internal review processes. The external evaluation team visits three of the ten institutions in order to perform focus groups and interviews with Scholars, faculty mentors, program staff, and campus administration. An electronic survey is distributed to Scholars throughout the alliance. Interviews are also held with the project director and other program staff at the lead institution. Using data collected through these methods as well as data provided by the project director, the evaluation team creates an analysis of the success of the LSAMP program as an alliance. They offer recommendations to improve the program as a whole as well as give quality feedback to the site visit campuses. This year, the University of Kentucky also completed an informal self-review.

2022-2023 Goals: Addressing Internal and External Reviews

1. Identify Advisory Board Members to replace those that are no longer affiliated with the KY WV LSAMP program. *Status: Under Discussion*
2. Improve tracking of LSAMP Scholars by following the NSF recommendation of using Level One and Level Two designations. *Status: Under Discussion*
 - a. Level One Scholars: Any student that receives funding or stipends dependent on their agreed upon contract with their respective institution.
 - b. Level Two Scholars: Any student that does not receive funding or stipends, but participates in some form of LSAMP services or events.
3. Objectives 1 & 2 are now compiled by a partnership with CPE, WVHEPC and UK’s Institutional Research, Analytics, and Decision Support Team. This will decrease the opportunity for human error when reporting enrollments and degree conferment. This team will be consulted to review all data for the LSAMP award and assist in uploading data to LSAMP/BD WebAMP in the future. *Status: Complete*
4. Develop a KY WV LSAMP Handbook that will outline all standard operating procedures (SOPs) which include: standardized reporting systems (i.e. semesterly Qualtrics survey to be

completed by all partners), standardized forms, branding standards (including Congressman Louis Stokes eponymous recognition), budget guidelines, a calendar of activities, onboarding for all stakeholders and ongoing marketing strategies for recruiting more mentors and scholars.

Status: Under discussion

5. Identify a shared virtual platform agreed upon by all the partners to house SOPs enabling all partners transparent access to all Alliance activities and data. This system will address lags in sharing important content and opportunities to our scholars. *Status: Under Discussion*

6. Complete the IRB's recommendations by Fall 2022 so research activity can resume. *Status: In process*

7. WVU will resubmit the Bridge to the Doctorate proposal as determined at the Summer 2022 retreat. *Status: Complete*

8. To increase research opportunities for scholars, each partner will be tasked with submitting an action plan that includes marketing strategies and identified research opportunities at the Fall 2022 retreat. *Status: Under Discussion*

9. To increase highly skilled peer-to-peer mentoring and coaching, all scholars will be highly encouraged to attend a 4 hour virtual training accredited by the International Coach Federation that focuses on best practice foundational coaching and mentoring skills. This training will be offered once per year and led by the award-winning University of Kentucky Integrated Success Coach team. For students who would like to participate, but cannot attend the live training, an asynchronous training will be made available. *Status: In process*

10. Return to in-person symposium with rotating sites starting in Spring 2023. *Status: In progress*

11. Re-establish the annual recurring meeting between the director and external evaluator. *Status: Complete*

12. Adapt NSF's recommendation to broaden the definition of STEM. *Status: Under discussion*

13. Review organizational structure, dual-leadership roles and restructure as needed to decrease any semblance of conflicts of interests. *Status: Under discussion*

External Partnerships and Funding

Scholars are encouraged to apply for summer internships through local, state, and federal programs as well as industry. Participation in these programs provides Scholars with a wider range of experiences and a larger professional network. These paid summer internships also allow better leveraging of KY-WV LSAMP funds, so the program can support more participants during the academic year as well as the summer. In addition, KY-WV LSAMP has partnerships and collaborations with other organizations, agencies, departments, and companies.

Kentucky EPSCoR

Kentucky Experimental Program to Stimulate Competitive Research exists to stimulate sustainable improvements in the Commonwealth's R&D capacity and to advance science and engineering capabilities for discovery, innovation, and knowledge-based prosperity. KY EPSCoR's activities are focused upon: developing human and physical infrastructure to advance academic research, promoting and nurturing a culture of innovation and economic creativity, and supporting increased STEM education, workforce development, and research participation diversity. <http://kyepscor.org/>

NASA Kentucky

Kentucky's Space Grant Consortium partners with NASA to advance research, education, and workforce development within the state. Managed alongside Kentucky's NASA EPSCoR, these programs promote aerospace-related scientific and technological innovation. <http://nasa.engr.uky.edu/>

Organization for Tropical Studies (OTS)

OTS hosts an REU in Costa Rica. The NSF LSAMP REU (open to students from LSAMP member institutions): students will be living at La Selva Research Station or Las Cruces Research Station for their nine-week research experience. Features of this program include 1) research skills in the field, 2) enhancing communication skills through training in scientific writing, oral presentations, science blogging, and videography, and 3) integration of cultural experiences with research development. The program will focus on environmental topics such as biodiversity conservation and agroecology and will offer opportunities to interact with local farmers, smaller field stations, and/or environmental NGOs. <https://tropicalstudies.org/course/reu/>

Research Experiences for Undergraduates

The REU program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program. https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517

Dissemination

There have been several avenues for dissemination. KY-WV LSAMP continues to update the program website by continuing to add resources for Scholars, faculty mentors, and program staff. There continue to be plans for Co-PI's, campus coordinators, and the project director to submit abstracts to conferences and continue working on articles for peer-reviewed journals. In addition to the presentation and publications mentioned in the research study section, other examples of 2021-22 dissemination includes:

- Deshler, J., Fuller, E., McEldowney, T., Miller, D., Pascal, M., & Stewart, J. (accepted). Case study of an emerging scholars program at a predominantly white institution: Analyzing the success of underrepresented students in an inquiry-based calculus sequence. *Justice through the Lens of Calculus*.
- Miller, D., Deshler, J., McEldowney, T., Stewart, J., Fuller, E., Pascal, M., & Michaluk, L. (2021) Supporting student success and persistence in STEM with active learning approaches in emerging scholars classrooms. *Frontiers in Education*, 6. 10.3389/educ.2021.667918
- Miller, D., Deshler, J., McEldowney, T., Stewart, J., Fuller, E., Pascal, M., & Michaluk, L. (2021) Supporting student success and persistence in STEM with active learning approaches in Emerging Scholars Classrooms. Louis Stokes Midwest Regional Center of Excellence Annual Conference, October 24, 2021.
- Michaluk, L., Glenn, M., Williams, F., Miller, D., Henderson, R., Stewart, J., & Stewart, G. (2021). LSAMP Scholar's academic motivations, STEM self-efficacy, and other non-cognitive factors important to STEM interest and success. Louis Stokes Midwest Regional Center of Excellence Annual Conference, October 23, 2021.

Proposal for Bridge to the Doctorate Funding

In November 2019, KY-WV LSAMP submitted a proposal for Bridge to the Doctorate funding. In May 2020, funding was awarded. KY-WV LSAMP is now supporting a cohort of 12 graduate students at the University of Kentucky. More information on the progress of the UK BD project can be found in the BD Annual Report.

November 2021, West Virginia University submitted a proposal to host a cohort of BD Fellows. Unfortunately, that proposal was not awarded.

Faculty And Staff Highlights And Professional Development

KY-WV LSAMP program administration and staff continue to be active in their respective fields as well as disseminate best practices learned via LSAMP. KY-WV LSAMP support staff are an important aspect of the program. Project staff continue to seek professional development opportunities.

Articles

Le J, Feygin Y, Creil L, Lohr WD, **Jones VF**, Williams PG, Myer JA, Pasquenza NA, Davis D. Trends in diagnosis of bipolar and disruptive mood dysregulation disorders in children and youth. *Journal of Affective Disorders*. 2020; 264:242-248.

McGruder, Charles H; "Comparison between the Gravitational Redshift in the Kerr and Schwarzschild Fields" February 2021 DOI: 10.21203/rs.3.rs-276860/v1

A. Babaei, **J. Parker**, and P. Moshaver, “Energy resource for a RFID system based on Dynamic Features of a Reddy-Levinson beam”. Proceedings of the ASME International Mechanical Engineering Congress and Exposition (IMECE 2020), 2020.

Other Highlights

David Cartwright presented a roundtable session on “Networking for Undergraduates” at the 2021 LSMRCE Virtual Conference: Empowering Diverse STEM Innovators on October 22, 2021.

Jessica Deshler was promoted to Interim Assistant Dean for Graduate Studies in the Eberly College of Arts and Science.

Philemon Johnson joined the UK Cohort as LSAMP Coordinator after the departure of Raul Torres.

Erin Howard was selected as the new Assistant Dean of Global Learning.

Shirley Wu was selected by the Commission on Diversity and Racial Equity (CODRE) for the 2022 Presidential Exemplary Multicultural Staff Award and was a featured speaker for “Celebrating AAPI Heritage” at the University of Louisville on April 14, 2022.

Scholar And Alumni Highlights

Articles and Conference Papers

Alicea, N., Chani, A., Le, L., Suengaga, H., Toth, D., Van Voorhis, S., & Wooten, J. (accepted). Creating a graphical tool for non-programmers to use to make heatmaps. *Journal of Computational Science Education*.

Martin, P. J., Fayida, T. L., Woods, A., & Hobbs, S. R. (2022). Assessing glyphosate contribution from agricultural runoffs on groundwater quality in Central Kentucky. *Water Professionals Connector*.

Thorley, K. J., Benford, M., Song, Y., Parkin, S. R., Risko, C., & Anthony, J. E. (2021). What is special about silicon in functionalized organic semiconductors? *Materials Advances*, 16. doi: 10.1039/D1MA00447F

Individual Accomplishments

Many Scholars made accomplishments and received honors throughout the 2021-22 academic year. Below are some examples of KY-WV LSAMP Scholar accomplishments:

Nolan Abdelsayed, UK Scholar, conducted research studying the meningeal lymphatic research in mice during the summer and fall of 2021, as well as spring 2022. He also presented at the AARTS Symposium, 2021 Neuroscience Clinical Translational Research Symposium, and LSAMP Research Symposium.

Ella Aponte, Centre Scholar, was invited to speak at the dedication of the renovated space for Centre College's Foucault Pendulum.

Yaroon James Arciaga, WVU Scholar, presented his research on "Perspective on Mastery-Based Grading" for a Human Engagement Division oral presentation at the WVU Summer Research Symposium.

Francisco Beltran, UK Scholar, continued his pharmacy research during the 2021-2022 academic school year.

Will Britt, Former Centre Scholar, was hired by the Pittsburgh Steelers as an analyst, applying his former research with Dr. Jeff Health.

Cristian Cuevas-Mora, WVU Scholar, presented his research on "Implementation of a Convolutional Neural Network of Object Classification" in the Engineering Division for the WVU Summer Research Symposium.

Paola Flores, Former KYSU Scholar, was recognized for her contribution as a military service person.

Alandrea Harris, UK Scholar, was granted admission to the 2022 Laney Graduate School Summer Opportunity for Academic Research (LGS-SOAR) Program.

Chloe Hernandez, WVU Scholar, presented her research on "Optimization of Multiphoton Imaging for Quantification of Cerebral Microvessel Permeability in Murine Ischemic Stroke: in the Neuroscience Division for the WVU Summer Research Symposium.

Caleb Jiggetts, Marshall Scholar, was offered a summer internship at Lockheed Martin.

Morgan Johnson, Marshall Scholar, was offered a summer internship at Northrop Grunman.

Imari Leftwich, Marshall Scholar, was offered a summer internship at Boeing.

Savannah Lewis, UK Scholar, was the topic of an article and video production about encouraging diversity in the field of engineering by UKNOW and UK SEC networks.

John Mendoza, WVU Scholar, presented his research on “The Impact of Stress during Puberty on the Developing Hypothalamus” in the Neuroscience Division for the WVU Summer Research Symposium.

Rachel Morris, WVU Scholar, presented her research on “From Here to There: Transporter Expression through Tsetse Fly Development” and was the runner-up winner in the Behavior and Social Science Division for WVU Summer Research Symposium.

Spencer Reginer, WVU Scholar, presented his research on “A Novel Solution to Inertial Measurement Unit (IMU) Location Drift During Long Distance Traversal” for a Physical Science and Engineering Division Oral Presentation at the WVU Summer Research Symposium.

Madison Robinson, WVU Scholar, presented her research on “Single Vape Exposure in Middle Cerebral Artery Function over a 72-hour Period” in the Health Science Division for the WVU Summer Research Symposium.

Jamie Smith, WVU Scholar, presented her research on “Additional Examples of the Rare Anterior Fibulocalcaneus Muscle” in the Health Science Division for the WVU Summer Research Symposium.

Isabel Weeks, WVU Scholar, presented her research on “Far-red LED Light Treatment Increased Shoot Height and Diminished Root Capacity in Kale” in the Agriculture and Environmental Science Division for the WVU Summer Research Symposium.

Alexis Woods, UK Scholar, conducted water quality and sustainability research during Spring 2022 and had an abstract accepted for the ACS meeting in Chicago.
