KY WV Louis Stokes Alliance for Minority Participation in STEM

2022-2023 Annual Report

Submitted to:

The National Science Foundation

2415 Eisenhower Avenue

Alexandria, VA 22314

Submitted by

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2023 KY-WV LSAMP Symposium Attendees

Project Personnel

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Key Personnel by Campus (PIs, Campus Directors and Campus Coordinators)	
University of Kentucky	**Eli Capilouto, DMD, ScD** **President, University of Kentucky** **Principal Investigator** elic@uky.edu **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 **Johne Parker, Ph.D.** Associate Professor, Engineering Co-Principal Investigator LSAMP Campus Co-Director

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Marshall University	**Marcie Simms, Ed.D.** (Summer 2022-present) Vice President Intercultural and Student Affairs Marshall LSAMP Campus Director Marshall University marcie.simms@marshall.edu **David Cartwright** Research Associate LSAMP Campus Coordinator Marshall University cartwrig@marshall.edu
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West Virginia State	**Hannah Payne**

University	Director: Center for the Advancement of STEM WVSU LSAMP Campus Director & Campus Coordinator West Virginia State University hannah.payne@wvstateu.edu

Other Key Personnel	
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Julie Bradley, MA, PCC Associate Director of Integrated Success Coaching, Transformative Learning Acting Director, KY-WV LSAMP & UK Campus Director University of Kentucky julie.bradley@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 678 URM STEM degrees granted in 2021-2022 across all Alliance institutions. This is a 15% increase from the baseline year of this award cycle (592 degrees in 2017-18).
- So far, during this award cycle, 3,144 total URM STEM degrees have been granted across all Alliance institutions.
- There were 3,329 URM students enrolled in STEM degrees in 2021-2022 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.
- KY-WV LSAMP Scholars presented research, published articles, attended conferences, and participated in summer research programs. Select individual accomplishments are listed.
- There were 257 attendees to the 2023 KY WV Symposium held at the University of Kentucky on March 31 and April 1, 2023.

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. 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.

The KY WV LSAMP program, upon recommendation of the external evaluator to allow for more specific data tracking, adopted Level One and Level Two Scholars. Definitions of these scholars can be found in the charts below.

LEVEL ONE SCHOLARS	
LEVEL ONE SCHOLARS Minimum Qualifications	1. U.S. Citizen or Permanent Resident 2. Full-time enrollment in a STEM degree program 3. Belong to a targeted minority group 4. African American 5. Hispanic / Latino 6. Native American / Native Alaskan 7. Pacific Islander / Native Hawaiian 8. Acceptance Form – Acceptance Form –Not returning your acceptance form by the deadline may result in a withdrawal of the Level I stipend. 9. KY-WV LSAMP Recognition – The KY-WV LSAMP NSF number (HRD 1826763) must be listed as a source of support in presentations, publicity, and publications. You must add “KY-WV LSAMP Scholar” to your email signature line. 10. Scholars Meetings – Attendance of the monthly Scholars Meeting is mandatory for all LSAMP Scholars. A list of meeting dates and topics will be provided – be sure to mark your calendar. 11. Maintain a 3.0 GPA or higher, or show reasonable progress toward a 3.0 GPA. 12. Participate in on campus supports as deemed appropriate by your campus (Success Coaching,

	Tutoring, Supplemental Instruction, Transition Supports, etc.) 13. Demonstrated desire to promote the efforts of KY-WV LSAMP in underrepresented communities 14. Demonstrated intent to pursue investigative studies / research. 15. Demonstrated desire to pursue a graduate degree in a STEM discipline. 16. Demonstrate a desire to attend graduate school. 17. Participate in one Integrated Success Coaching Session per semester (FALL/SPRING).
Type of Funding	LEVEL ONE SCHOLARS receive direct funding
Examples of Direct Funding	Stipends are distributed on a competitive basis. Because of this, the program collects individual information on LEVEL ONE SCHOLARS as required by NSF. Examples of direct funding include the following (and similar types of activities): ● Research experiences ● Travel ● Stipends for participation in programs and/or activities ● Payment for providing tutoring services ● Conference Fees for Presenters
When can students qualify?	Students are identified once per semester as LEVEL ONE SCHOLARS.

LEVEL TWO SCHOLARS	
LEVEL TWO SCHOLAR Minimum Qualifications	LEVEL TWO SCHOLARS include underrepresented minority groups and others (i.e. Asian, nonminority, etc.) who are participating in an LSAMP sponsored or partially sponsored activity. LEVEL TWO SCHOLARS who attend or participate in any

	activity sponsored by LSAMP where: ● LSAMP funds are used to pay for all or part of the expenses associated with an event; ● students who attend events where LSAMP provides assistance to an organization and/or execution of an event (even if no LSAMP funds are directly used); ● or students who receive assistance from LSAMP personnel.
Type of Funding	LEVEL TWO SCHOLARS receive indirect funding. This type of funding is NOT considered "sponsored". "Sponsored" refers to both financial and human resources being supplied.
Examples of direct funding for LEVEL TWO SCHOLAR	Workshops, tutoring, seminars, trainings, success coaching, orientations, conferences, career days, field trips, shadow experiences, tutoring, advising, and assistance with applications for scholarships, graduate school, internships, etc.
When can students qualify to be LEVEL TWO SCHOLARS?	Eligible students may become LEVEL TWO SCHOLARS at any time during their undergraduate degree program. Eligible students have the opportunity to move to LEVEL ONE SCHOLARS once per semester during the open application window. LEVEL ONE SCHOLARS who do not meet the requirements of LEVEL ONE, move to LEVEL TWO to continue to be supported with the intention of regaining LEVEL ONE status.

Data Collection and Analysis Procedures

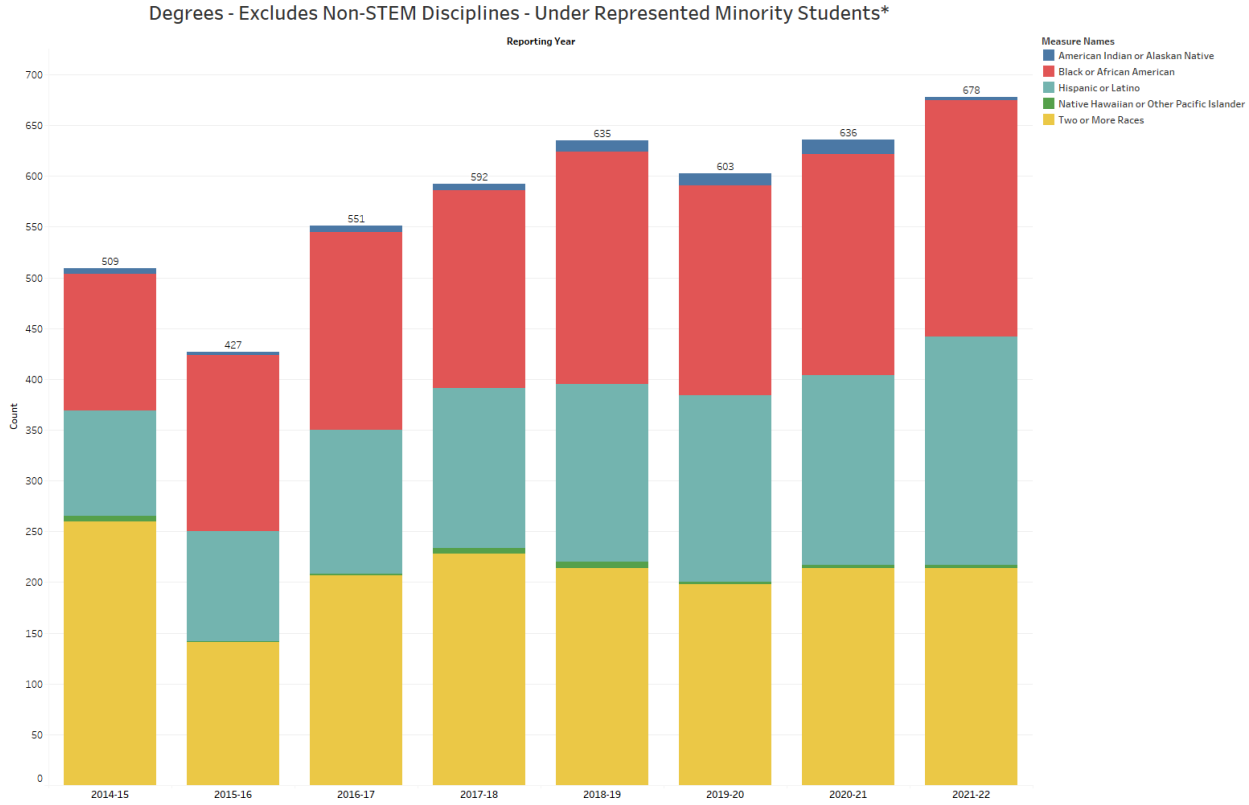
KY WV LSAMP data collection and analysis is led by the University of Kentucky's Institutional Research Analytic Decision Support team (IRADS). IRADs works closely with Kentucky's Council of Post-Secondary Education (CPE) and the West Virginia Higher Education Policy Commision (WVHEPC) to provide the 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 678 URM STEM degrees granted in 2021-2022 across all Alliance institutions. This is a 15% increase from the first year of this award cycle (592 degrees in 2017-18). So far, during this award cycle, 3,144 total URM STEM degrees have been granted, for an average of 629 per year. Chart one shows URM degrees awarded in STEM 2014-2015 through 2020-2021. Table one shows degrees awarded by race.

**the charts below is based on the Bachelor, Master, and Ph. D. levels that are submitted to WebAMP



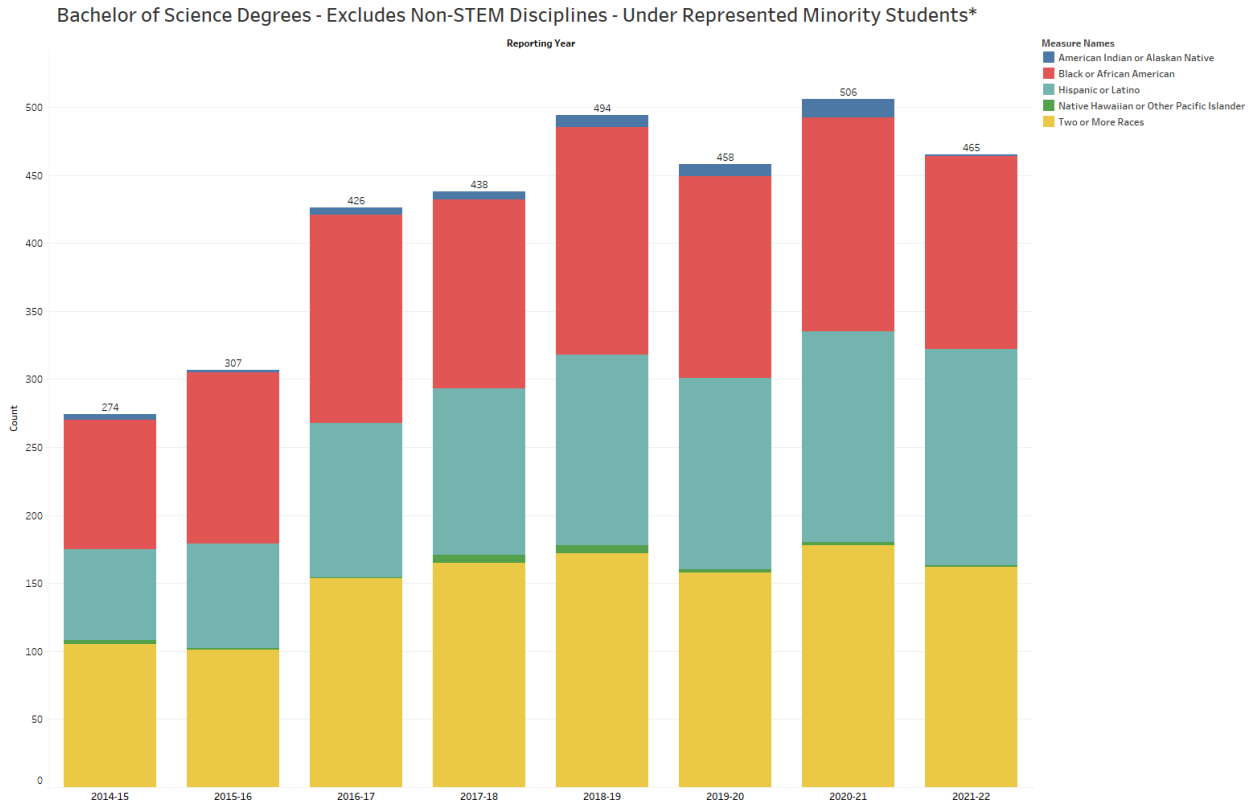
Degrees - Excludes Non-STEM Disciplines - Under Represented Minority Students*

	Reporting Year							
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
American Indian or Alaskan Native	5	3	6	6	11	12	14	3
Black or African American	135	174	195	195	229	207	218	233
Hispanic or Latino	104	108	142	157	175	184	187	225
Native Hawaiian or Other Pacific Islander	5	1	1	6	6	2	3	3
Two or More Races	260	141	207	228	214	198	214	214

Projected Outcome Two

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

There were 465 Bachelor of Science URM STEM degrees granted in 2021-2022 across all Alliance institutions. This is a 6% increase from the first year of this award cycle (438 degrees in 2017-18). So far, during this award cycle, 2,361 total BS URM STEM degrees have been granted, for an average of 472 per year. Chart one shows URM BS degrees awarded in STEM 2014-2015 through 2021-2022. Table one shows BS degrees awarded by race.



Bachelor of Science Degrees - Excludes Non-STEM Disciplines - Under Represented Minority Students*

	Reporting Year							
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
American Indian or Alaskan Native	4	2	5	6	9	9	14	1
Black or African American	95	126	153	139	167	148	157	142
Hispanic or Latino	67	77	114	122	140	141	155	159
Native Hawaiian or Other Pacific Islander	3	1	0	6	6	2	2	1
Two or More Races	105	101	154	165	172	158	178	162

Projected Outcome Three

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

Preliminary data for the 2022-23 academic year indicates there were 34 KY-WV LSAMP participants who graduated with STEM bachelor's degrees. Of those students who graduated in the 2022-23 academic school year, consortium institutions reported 14 students (41%) were accepted to graduate and/or professional degrees. Overall, this percentage of graduate school acceptances is an increase from last year (20%).

Projected Outcome Four

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

KY-WV LSAMP member institutions reported 209 KY-WV LSAMP level 1 participants in the 2022-23 academic year. Of those 209 participants, 23% (49) of students participating in LSAMP cohorts conducted research during the academic year. This is an increase from the previous year (12%).

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 33 (15.8%) Scholars have internships for summer. This is an increase from the previous year (13%).

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 2022-23, KY-WV LSAMP member institutions reported that participants made 35 conference presentations. This was an increase from the previous year (34 documented presentations).

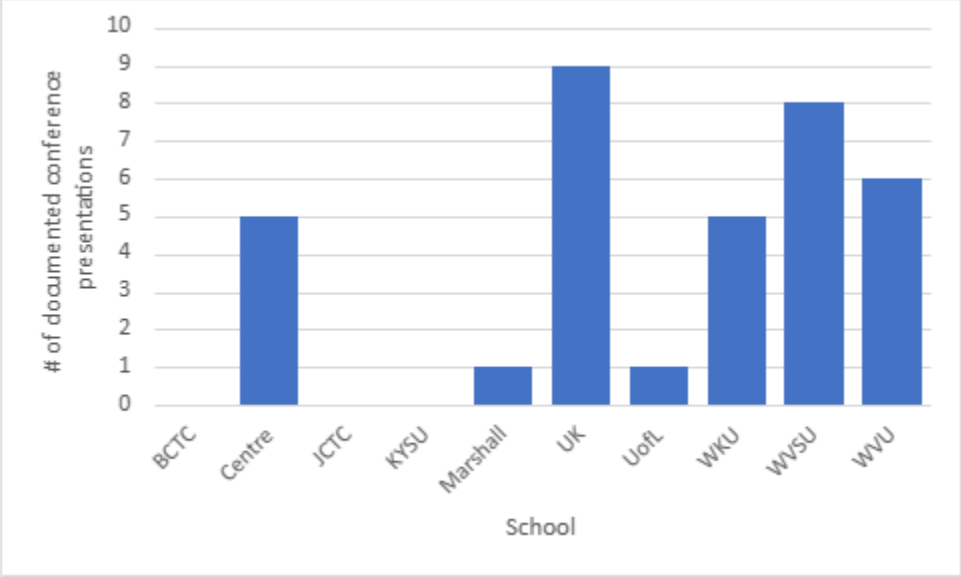


Figure 6: Number of Presentations Made by KY-WV LSAMP Scholars by Institution in 2022-23, as Reported by Member Institutions

Scholars presented at local, state, and national conferences that included, but were not limited to the Spring American Chemical Society National Meeting, Centre College's RICE symposium, West Virginia Research Day at the Capitol, and the KY-WV LSAMP Annual Research Symposium. Figure 6 shows the breakdown of presentations reported by institution and type. Figure 7 shows a comparison of presentations by academic year.

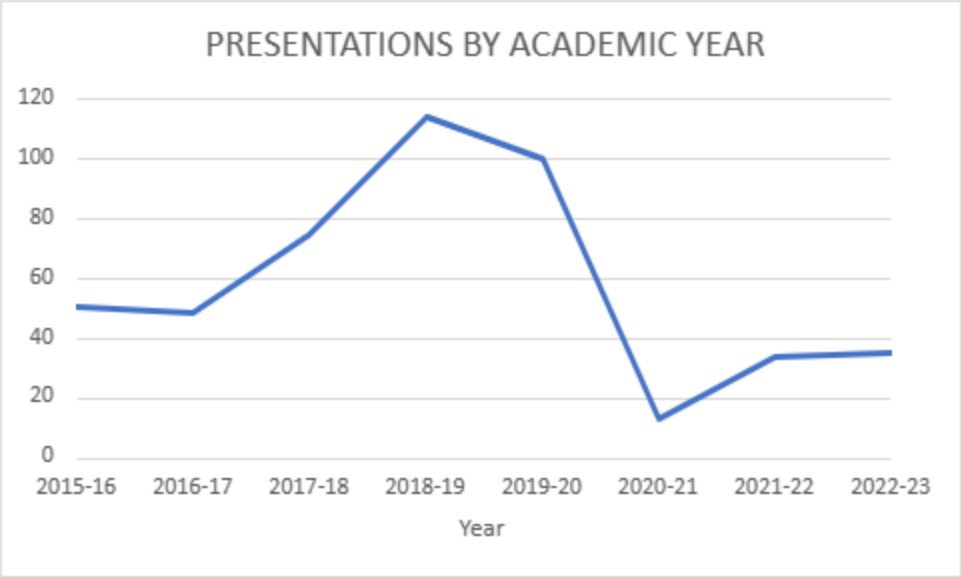


Figure 7: Comparison of Presentations by Academic Year

Projected Outcome Seven

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

Covid 19 played a major impact on international research participation for this cycle of the KY WV LSAMP grant which not only decreased opportunities for international research, but also left Scholars hesitant to travel and take part in international activities. To increase the interest in international research, the Alliance made the 2023 KY WV LSAMP Symposium's major focus on international research (See section on the 2023 LSAMP Symposium).

Pre-Covid 19, 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.

Projected Outcome Eight

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

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 (3.32) compared to the previous year (3.2).This is the highest on record. Figure 8 shows the average GPA of KY-WV LSAMP Scholars across member institutions, as reported by site coordinators, from 2014-15 to 2022-23.

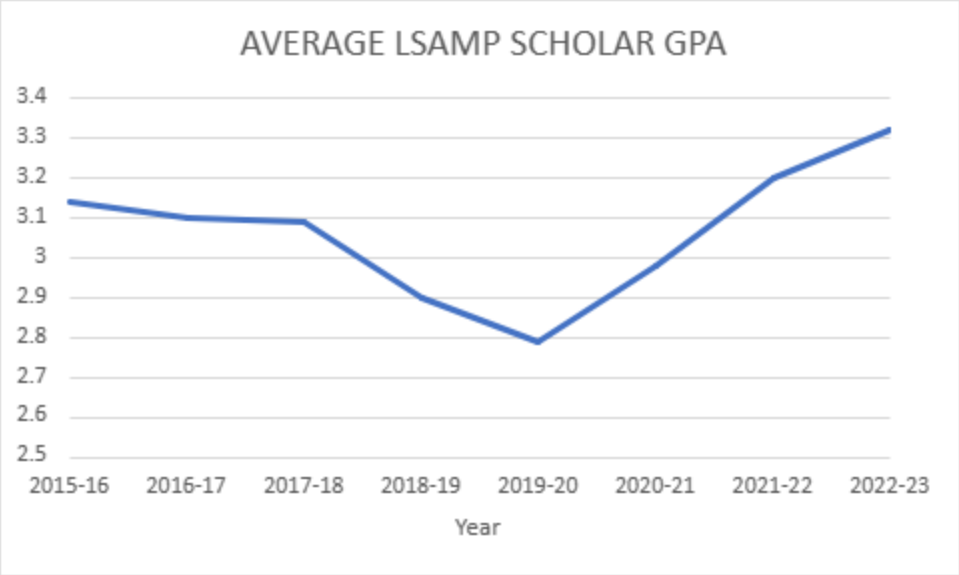


Figure 8: GPA Averages from 2014-15 to 2022-23

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 2022-23 showed that KY-WV LSAMP supported 209 Scholars. This is a decrease from the previous year (348 scholars) and is below the goal of 319 participants by 2022-2023 academic year. Figure 9 shows the number of KY-WV LSAMP participants each year. These decreases were anticipated due to three major factors: 1. Adjusting the definitions of scholars based on the external evaluator's recommendation to show accurate KY WV LSAMP participation, 2. The impact of major budget challenges facing WVU (Hartocollis, 2023), and 3. The national trend of declining enrollment in institutions of higher education (Fischer, 2022).

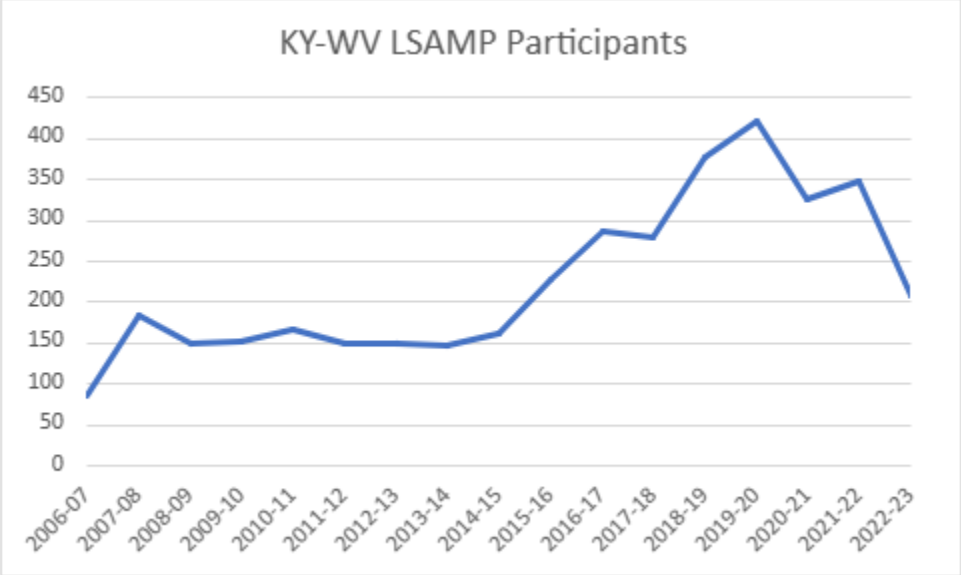


Figure 9: Number of KY-WV LSAMP Participants by Year

Proposed Activities

Scholar Activities: Symposium

KY-WV LSAMP Annual Research Symposium

The KY-WV LSAMP 15th Annual Research Symposium was originally scheduled as a hybrid event on March 31-April 1, 2023. This year's symposium took place Friday night at the Cornerstone Esports facility and Saturday at the Gatton Student Center, both on the University of Kentucky's campus, with portions of the conference offered virtually.

Highlights of the 2023 Symposium

Keynote Speakers:

This year's symposium hosted three keynote speakers and a welcome from Dr. Capilouto.

- Dr. Capilouto welcomed members of the KY WV LSAMP Symposium.

- [Dr. Carlotta Berry], Lawrence J. Giacoletto Endowed Chair and Professor of Electrical and Computer Engineering, Rose-Hulman Institute of Technology
    - Dr. Berry's areas of expertise include educational mobile robotics and enhanced human-robot interfaces. She is also the founder of the Tose Building Undergraduate Diversity (ROSE-BUD), a student group that she advises that promotes recruitment and retention of URPs in STEM fields.

- Emmanuella Bassey, Undergraduate Student, University of Texas at Austin
    - Ms. Bassy is a senior Neuroscience major and French minor on the pre-medical track and plans to pursue a Master's degree in research at the Universite de Toulouse III - Paul Sabarier. Through the avenue of LSAMP, Emmanuella conducted neuroscience research at the Paris Brain Institute (Institut de Cerveau) in the summer of 2022.

- Denise Y. Yates, Senior Research Scientist, University of Texas El Paso
    - Ms. Yates was selected as a 2022-2025 Fullbright Specialist of which she developed an eight week pilot student research exchange program. The LSAMP International Center of Excellence, in partnership with Universite Toulouse III-Paul Sabatier, will facilitate the opportunity for 20 LSAMP scholars to participate, while 10 Master's level French students will come to the US to conduct research at US institutions.

Breakout Sessions:

There were seven breakout sessions at this year's symposium. They included:

For LSAMP Leadership: Questions about your budget?

Led by Darin Cecil, UK, Financial Lead

Conversations about Graduate School

Panelist: Aaron West, Dave-Preston Esoe, Emmanuella Bassey

Moderated by: Dr. Parker, Co-PI

Turning your Work into a Conference Presentation and/or Publication

Led by Dr. Kelly Bradley, Co-PI

The Scholar's Guide to Time Management: Achieve More and Stress Less

Led by Molly McAndrew, Integrated Success Coach

LSAMP Leadership Best Practices: Using Active Learning Strategies and Canvas with your Cohort

Led by Trevor Tierney, UK Campus Coordinator

Professional Development Begins on Day One: From Crafting Your First Resume to Interview Prep to Evaluation and Negotiating Full Time Job Offers

Led by Betsy Davies, J.D., Director for Career Development and Employer Relations UK Engineering

External Evaluator Interviews

Coordinated by Julie Bradley, KY WV LSAMP Acting Director

Pictured: Dr. Capilouto and Dr. Willie Pearson

For LSAMP Leadership: Learn about setting up your student for international Experiences

For LSAMP Scholars: Learn about international research opportunities.

Denise Yates, MSEd., SR. Research Scientist and Fulbright Specialist

Poster Sessions

Eleven LSAMP and BD Scholars presented posters at the 2023 KY WV Symposium. (*Indicates LSAMP Scholar and **indicates BD Scholar.)

**Davis, Kai. (2023, April). Characterizing Avian Community Response to Two Decades of Urban Reforstation in Central KY. KY WV LSAMP Symposium, Lexington, KY. Mentor: John Cox, UK

*Garcia, Cristian Samano. (2023, April). Quality Variations in Thyrotropin Alfa. KY WV LSAMP Symposium, Lexington, KY. Mentor: Robert Lodder, UK

*Guerro, Emily, Horne, Kayla, Covington, Jada, *Mensah, Lordina, Rice, Lizzie, & Hernandez, Andrea. The Symphony of the Cell: Using Data Sonification to Engage Students in Molecular and Cellular Biology. KY WV LSAMP Symposium, Lexington, KY. Mentor: Luke Bradley, UK

*Heckerman, Gabriel. (2023, April). The Protective Role of Melanin in the Inner Ear of Two Fish Species, Peocilia Latipinna & Cyprinus Carpio. KY WV LSAMP Symposium, Lexington, KY. Mentor: Michael Smith, WKU

*Hernandez, Jafet Rivera. (2023, April). FUNGI: Building a Better World. KY WV LSAMP Symposium, Lexington, KY. Mentor: Douglas Bright, WVSU

Leach, William R., *Oddo, Kai, & *Vela, Nathan Anthony G., & Wachter, Erin. Ruthenium (II) Polypyridyl Complexes with Attached NSDAIS as Potential Dul Mechanism of Action Therapeutics. KY WV LSAMP Symposium, Lexington, KY. Mentor: Erin Wachter, Centre

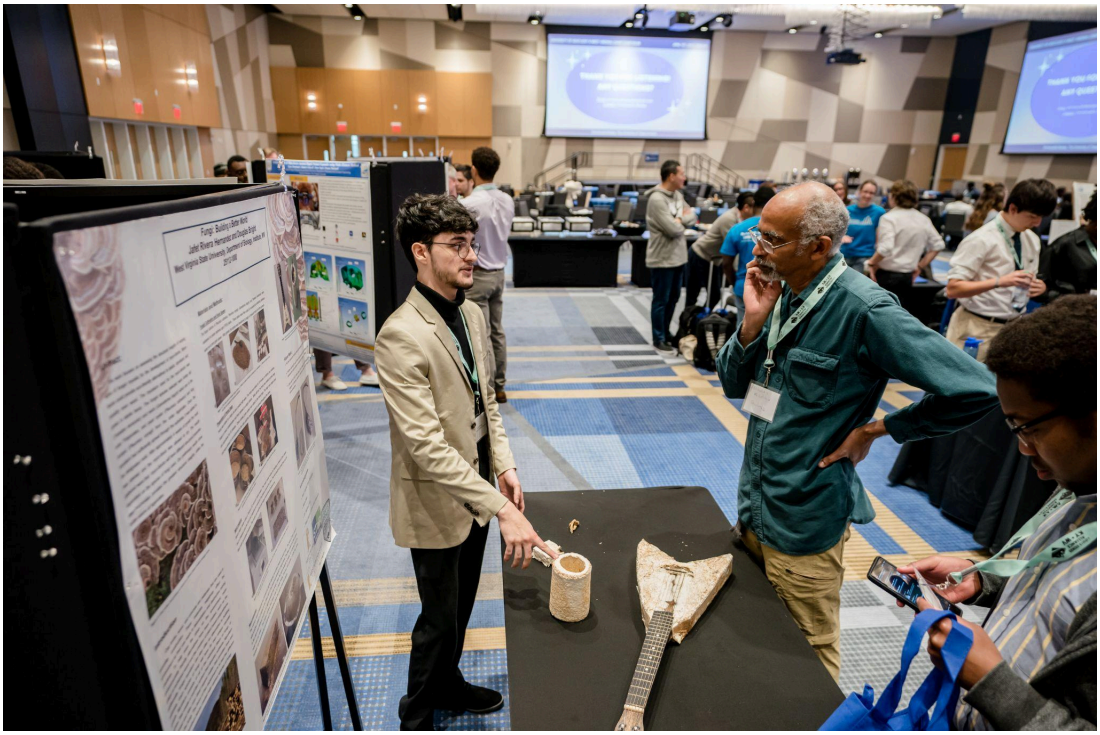
Obielodan, Olufemi. (2023, April). Analyzing Transit Times of Saittarius A Using Observed and Theoretical Data. KY WV LSAMP Symposium, Lexington, KY. Mentor: Charles McGruder, WKU

**Robinson, Ariel & Ojha, Sweta. (2023, April). PFAS in KY: Using GIS as a Tool for Predicting Potential Contanination “Hot-Spots”. KY WV LSAMP Symposium, Lexington, KY. Mentor: Kelly Pennell, UK

*Sullivan, Taya. (2023, April). Lenition is Scalar across Consonant Sets: Implications for Mental Representations of Language. KY WV LSAMP Symposium, Lexington, KY. Mentors: Jonah Katz & Sergio Robles Puente, WVU

Symposium Poster Highlights (Photos)


THANK YOU FOR LISTENING!
ANY QUESTIONS?




University of Kentucky
Quality Variations in Thyroglobin Assay


The Symphony of the Cell: Using Data Sonification to Engage Students in Molecular and Cellular Biology
Introduction
Results
Background Information
Conclusions
Methods
EXIT

Attendance:

This year's symposium was well attended. Unfortunately, the dates did overlap with WKU's Undergraduate Research Symposium and KYSU's participation in a national conference of which many of the scholars were required to participate. Overall, there were a total of 229 participants for the in-person portion of the event and 28 in attendance for the virtual portion of the event.

Symposium Attendance					
Scholars	**Faculty/Staff/ Other**	**Virtual**	**Poster Presentations**	**Academic Fair Representatives**	**Bridge to Doctorate**
114	45	28	11	40	2

Included in this year's attendance was President Capilouto and Provost Dipoloa. (Pictured below).

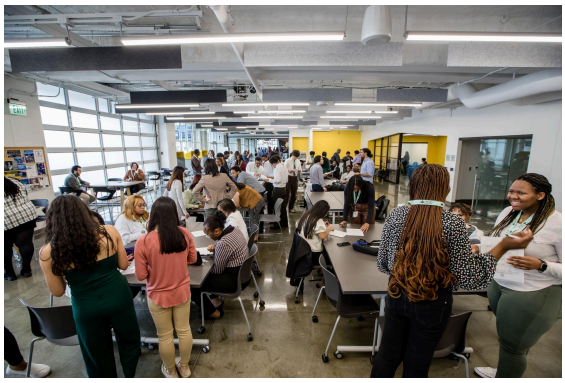
Academic Fair

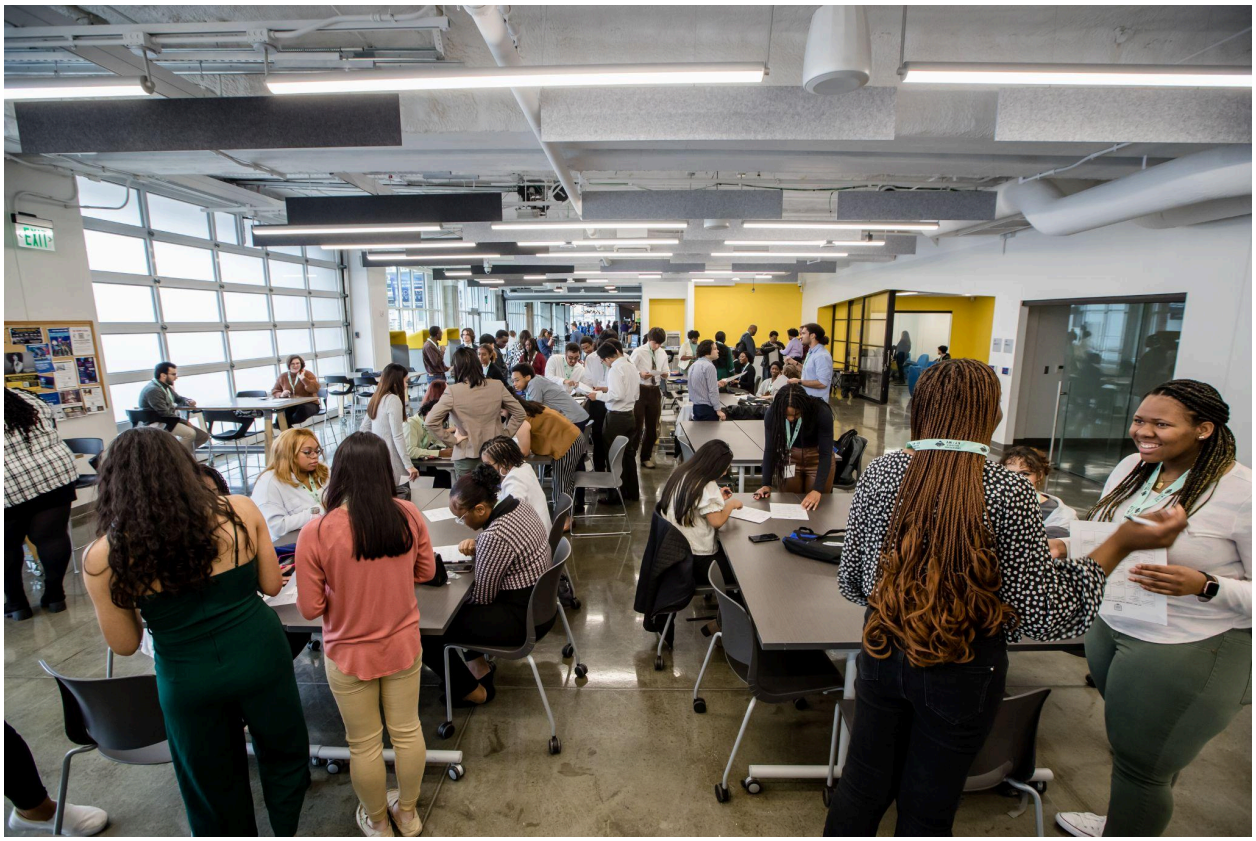
There were numerous institutions and programs participated in the academic fair at this year's symposium. They included:

- University of Kentucky S.T.A.R.T. (STEM Through Authentic Research & Training) Program
- University of Kentucky UKNEU-PREP Graduate Bridge Program
- Vanderbilt University School of

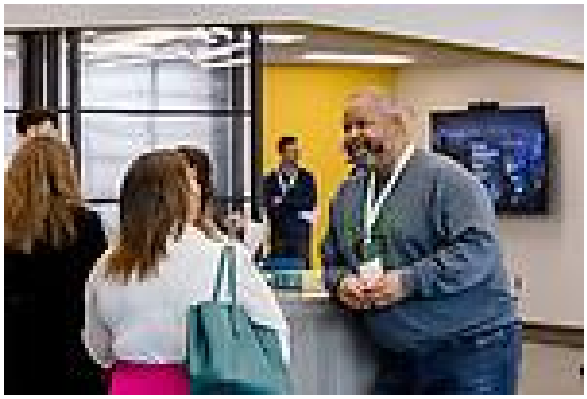
Engineering Graduate Programs
- Marshall University Graduate Programs
- University of Kentucky Graduate Programs
- West Virginia University Graduate Programs
- Kentucky State University Master of Computer Science Graduate Programs
- University of Kentucky Bridge to the Doctorate
- West Virginia State University Graduate Programs
- University of Louisville Graduate Programs
- University of Kentucky Integrated Biomedical Science Program & Summer Undergraduate Research in Environmental Health
- University of Kentucky Department of Agricultural Economics Graduate Program
- University of Kentucky NSF REU in Physics Undergraduate & Graduate Programs
- University of Kentucky Department of Statistics MS/Ph.D. Graduate Program
- University of Kentucky Department of Civil Engineering Graduate Program
- University of Kentucky, College of Pharmacy, Pharm.D. & Ph.D. Graduate Programs
- University of Kentucky Department of Biology Undergraduate & Graduate Program
- University of Kentucky Department of STEM Ed. Graduate Program
- University of Kentucky, Department of Transformative Learning, Integrated Success Coaching- TA Graduate Positions

Some Symposium Image Highlights:

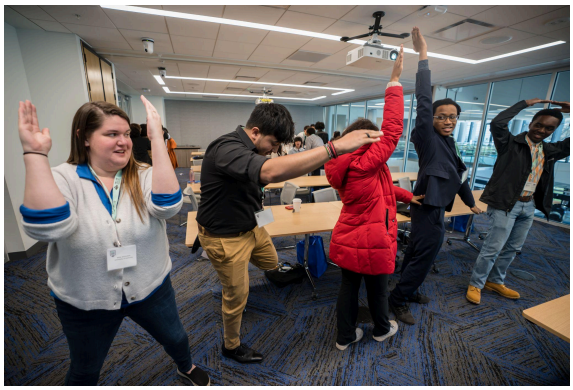



EXIT


2023 KY-WV LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION SYMPOSIUM
LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION
KY • WV




LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION
KY • WV



Scholar Activities: 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. Current LSAMP Scholars who were previously START Scholars were recognized in UKNow in the following articles:
    - UK Freshman Awarded Prestigious National Aerospace Fellowship
    - UK's START Program Receives Golden Apple Award
- 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.

Scholar Activities: 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 (individual and group) for LSAMP scholars in addition to mentor/coach training. 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 West Virginia State University, which has a laptop loan program so that students can borrow a laptop to complete their coursework.

Scholar Activities: 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 and UK have 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.

Scholar Activities: 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.

Scholar Activities: 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. Currently, the University of Kentucky is now hosting the BD. 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.

UKNeu-PREP

A new graduate school transitional support is the University of Kentucky (UK) Neuroscience - Postbaccalaureate Research Education Program (**UKNeu- PREP**) is one of six inaugural nationally-funded programs from NINDS dedicated to recruit and retain underrepresented minority post baccalaureate, from institutions without doctorate programs, to pursue graduate degrees in neuroscience. UKNeu-PREP participants will gain extensive biomedical research experience in neuroscience, while preparing participants through educational and professional development opportunities to acquire the knowledge, research experience, communication skills, and confidence to

successfully navigate the admissions process and student success in a strong, neuroscience graduate program. Currently 3 former LSAMP scholars from KYSU are slated to start in the Fall 2023.

Internet Presence

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.
https://kywvlsamp.uky.edu/

LSAMP and ULBB

JCTC's LSAMP program has coordinated with ULBB, Univ. of Louisville's Bridges to Baccalaureate, which is a program funded by the NIH where JCTC students participate in summer research projects at UofL. Since the students recruited for ULBB are also the target group for LSAMP, we reached out to those students to see if they wanted to participate in LSAMP too. In addition, two of the ULBB faculty, Co-PI Dr. Cindy Corbitt from UofL and Faculty Advisor Dr. Valerie Wheat from JCTC, agreed to do talks for our students. Dr. Corbitt talked about the research she does in her research lab as well as how she got into science; interested students were invited to tour her lab after her talk. Dr. Wheat will talk about biology of learning as well as how she got into science. As we move into next year. Jefferson's LSAMP program plans to continue to engage and support the dual-aligned LSAMP/ULBB student participants during the academic year, providing activities during the Fall and Spring semesters when the ULBB program does not actively meet. This partnership of programs will benefit students on both sides. In addition, we're hoping that ULBB may be able to recruit future students from our LSAMP students.

Alliance-Wide Oversight

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. This board meets once a year. The Institute Advisory Board met in the Fall of 2023.

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 below. Each of the 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. Currently, the KY WV LSAMP program has accepted nominations and is currently in the vetting process. We expect a full advisory board in place in the Fall of 2023.

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 Taylor	WV EPSCoR	Director	Research Experience and Professional Development

Table: 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." https://bluegrass.kctcs.edu/about/cultural-diversity/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://www.thellcec.org/

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/

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

Department of Transformative Learning/Integrated Success Coaching

UK's **Integrated Success Coaching** program has been nationally recognized as a leader in program design and interventions. The Integrated Success Coaching program provides one-on-one coaching, group coaching and mentor/coach training.
https://studentsuccess.uky.edu/transformative-learning/services/integrated-success-coaching

- **Individual Appointments:** Scholars leave each coaching session with a personalized action plan around topics such as goal setting, time management, study strategies, getting motivated, and stress management. Our coaches specialize in Academic Life Skills, Careers, Finances, Leadership, Identity Needs (i.e., ADHD, First Gen), and Wellness so you can meet with someone that best fits each scholar's needs.
- **Group Coaching Sessions:** Group Coaching is a stress-free, judgment-free way for LSAMP Scholars to develop the skills they need to be successful in college and beyond, while connecting with peers and certified Integrated Success Coaches in a collaborative environment. UK's Campus Coordinator works with

the coaching team to provide a variety of group coaching sessions for UK's cohort.

- **Mentor/Coach Training:** UK's Integrated Success Coaches offer mentor and coach training once per semester to all scholars, faculty and staff who take part in the Alliance. Those that participate in the training receive four hours toward International Coach Certification and four hours toward CRLA Peer Educator Certification.

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

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.

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

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 scholars 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 gift certificate at each participating institution to increase scholar participation in surveys, which had been low in previous administrations. Renewal of 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. Survey administration resumed in Fall 2022 and was opened for Spring 2023. A total of 122 unique scholars participated in this survey during the reporting period, or 45% of scholars alliance-wide (N = 273). In Spring 2023, the LSAMP programs survey was also administered, and 19 responses were collected alliance-wide (7% of scholars). Eight scholars also participated in interviews in Spring

2023. Data has been cleaned in preparation for analyses, discussed below in the Goals for the Coming Year section.

During the previous reporting period, distributing Amazon gift cards had been a problem and details about these issues were provided in the previous year's report. In Spring 2022, our IRB was suspended for this reason, but was reviewed and approved to resume research activity. During this reporting period, previously awarded gift cards were distributed by Dr. Kelly Bradley as were gift cards for current participants.

Overall Progress and Recent Dissemination.

In previous periods, survey and interview data collection and analyses were conducted on data collected since 2021, and the research plan timeline was adapted and extended to account for delays and interruptions in data collection. One issue that became evident in 2021 is that it was difficult to determine how many scholars are in the UK-WV LSAMP Alliance at any given time, because there is no method used alliance-wide 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 but do not receive funding, etc. This made it difficult to determine what percentage of LSAMP scholars were participating in surveys, and reviewers for the journal where study manuscripts have been submitted felt that this was a fatal flaw. To address this issue, a definition of LSAMP scholar was agreed on alliance-wide, and a single spreadsheet was distributed to collect data. Site coordinators carefully tracked the number of scholars receiving funding, which solved this problem.

The manuscript below was submitted for publication in 2021 as mentioned in the previous paragraph, but was rejected because of the sample size issue;. During the reporting period, we have continued to collect data with the intent of revising and resubmitting the manuscript. The list of authors may change as a result of revisions.

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.

The research study publication that was submitted reports on survey scores and interview responses related to our proposed research questions about 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. All research questions and data sources are below; the first publication submitted examined a subset of these:

1) How does student participation in LSAMP activities impact retention and graduation rates relative to non-LSAMP matched peers and to all STEM students at each institution?

This question has not been examined yet; retention and graduation data will be obtained in the final year of the project as proposed.

2) How do non-cognitive factors related to academic success (academic motivation, academic self-efficacy, grit, sense of academic belonging in STEM education, STEM academic identity, STEM attitudes, and experiences of racial microaggressions) evolve for LSAMP participants over the course of their participation relative to non-LSAMP matched peers?

Survey and interview data are being used to examine this question.

3) Do changes in non-cognitive factors account for success in either group? Does duration of participation mediate these factors for either group or for subsets of each group?

We obtained very few non-LSAMP STEM student responses on surveys over the duration of the project (N < 10) despite recruitment efforts, however, we plan to recruit non-STEM LSAMP students at institutions in the next reporting period. Survey data will then be used to examine this question if sample size allows.

4) Which LSAMP programs are most effective in retention and graduation and for which LSAMP students are they most effective? Is effectiveness a function of participation duration and/or location?

Survey and interview data are being used to examine this question.

5) Do LSAMP and non-LSAMP students report experiencing institutionalized racial microaggressions? What are the sources of microaggressions: peers, faculty, administration, or university staff? Do reported experiences differ at different sites?

Survey and interview data are being used to examine this question.

6) How do LSAMP activities impact 1) STEM course grades and 2) non-cognitive factors? Are some activities more effective in increasing each than others?

Survey and interview data are being used to examine this question.

Results of analyses in previous reporting periods showed that scholars' scores were high on average for most personal non-cognitive factors, and there were some

differences between genders discussed in more detail in the publication. In addition, 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 that they felt buffers 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 that helps retain them to STEM majors despite these and similar setbacks.

No presentations were submitted for review this year due to the suspension of our IRB.

Goals for the Coming Year.

We will continue to collect and analyze survey and interview data from scholars to answer our research questions and disseminate results. We have prepared a literature review for a manuscript and are in the process of analyzing results.

We have started psychometric analyses of the collected data. This should lead to presentations and publications. Validating a structurally sound instrument and identifying scalable components will be of interest in fields like measurement, STEM, higher education student success.

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. Currently, the BD is entering into a No Cost Extension (NCE). More details can be found in the BD Annual Report.

Institutional Support And Sustainability Plan

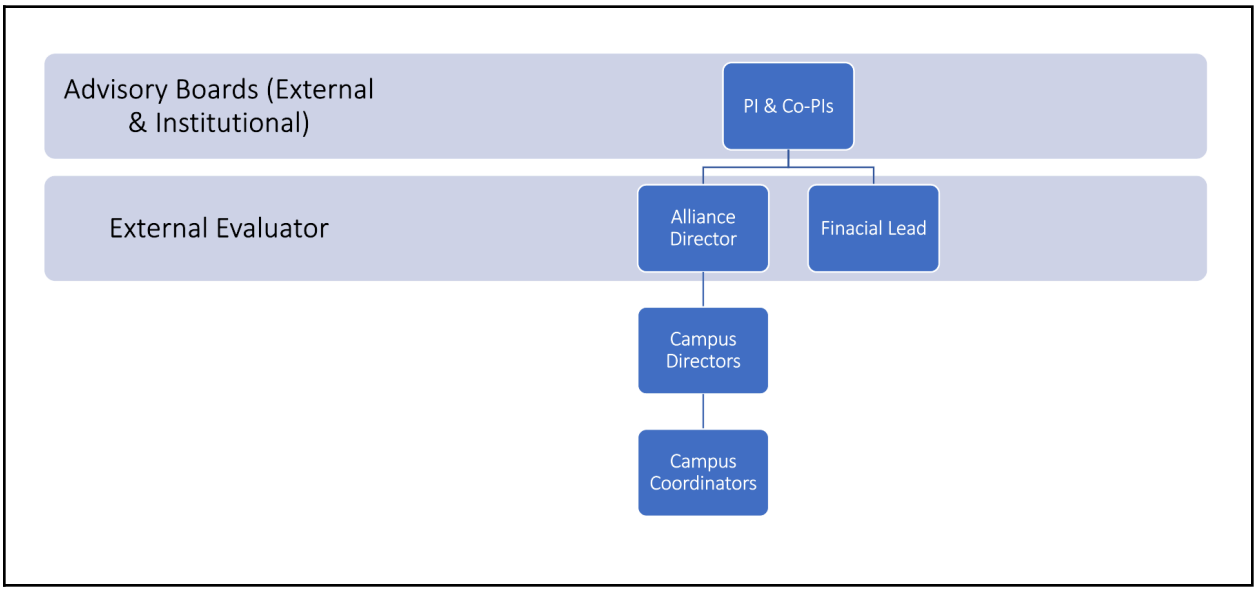
The Alliance plans to continue as a self-perpetuating consortium working to recruit and retain students into undergraduate and graduate STEM programs. Each campus has an institutional commitment for the continuation of the program. Examples of this commitment include, but are not limited to: 1) the Acting Director's salary and programmatic data analysis (IRADs) supported by the UK Office of the President, 2)

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. 3) In addition, each campus has connections and resources that help LSAMP leverage support for program participants.

The University of Kentucky's Office of the Vice President for Institutional Diversity lead by Dr. Katrice Albert 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. The Co-PIs, Dr. Bradley and Dr. Parker continue to work closely with OID to continue to support the KY WV LSAMP program and have begun to build industry partnerships.

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. Descriptions of project roles and the updated organizational chart are as follows. A current list of key personnel can be found on pages 5-10.



Program Staff Roles

Alliance Project Director

NOTE: 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. This task is now completed by UK's IRAD team to ensure accuracy and consistency of reporting.

Duties/tasks of the Alliance Director 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; 5) planning of the annual alliance retreat for all coordinators and program staff; 6) coordinating data collection and evaluation with UK's IRADs team; and 7) drafting the annual report and compiling feedback from Co-Pi's and alliance partners before submission.

Since March 2022, Julie Bradley, Associate Director of Integrated Success Coaching at the University of Kentucky, has been serving as the KY-WV LSAMP Acting Director. Ms. Bradley, under the direction of University of Kentucky Leadership and Alliance Co-PIs, 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, and assisting the current UK campus coordinator in leading programming for scholars on UK's campus.

Financial Manager

Darin Cecil, University of Kentucky, has been designated as the project financial officer at the University of Kentucky. Mr. Cecil (with help and oversight of UK's 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, 4) provides monthly reports to the PI, UK Co-PI, and project director, 5) processes

no-cost extensions, 6) lead payroll distributions, and 7) supports any critical budget needs. In addition, Mr. Cecil has assisted the Research Team in distribution of the Amazon cards for survey completion.

Co-Principal Investigators (Co-PIs)

Co-principal investigators are responsible for the scientific and technical direction and implementation of the project. The KY WV LSAMP currently has 4 Co-PIs. Currently, distribution of responsibilities include:

- Dr. Kelly Bradley, UK, Lead Co-Principal Investigator: budget oversight, research study team co-lead, best practice leader, conducts monthly campus director/coordinator check-in meetings during the academic year, reviews and submits the Annual Report, co-leads the annual president's meeting, oversee the submission to WebAmp, co-lead the annual campus coordinator's meeting, communicates with NSF, and other duties as needed.
- Dr. Johné Parker, UK, Lead Co-Principal Investigator: best practice lead, provides advisory board oversight, supports the planning of the symposium, reviews and submits the Annual Report, co-lead the annual president's meeting, co-lead the annual campus coordinator's meeting, communicates with NSF, leads the Bridge to the Doctorate, and other duties as needed.
- Dr. Lynn Michaluk, WVU, Co-PI: serves as the lead of the research study team and research initiatives, and other duties as needed.
- Dr. David Miller, WVU, Co: best practice leader, reviews and gives feedback on the Annual Report, co-leads the annual campus coordinator meeting, assists in the monthly campus coordinator best practice meetings, and other duties as needed.

Campus Directors and Campus Coordinators

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. Campus Directors are tasked with overseeing and supporting the Campus Coordinator 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, budgeting, and providing information to program administration for inclusion in alliance reports. The same individual serves as Campus Director and Campus Coordinator on some campuses. See pages 5-10 for a complete list of current directors and coordinators.

Alliance Activities

In-Person/Virtual Alliance Retreat

This year, the Alliance retreat took place at the University of Kentucky's Good Barn and virtually (synchronously) in the Fall of 2022. This was the first in-person gathering since the Covid-19 pandemic began. During the retreat, the discussion topics included: team building, alliance updates, symposium planning, evaluator recommendations, reporting data, the research study, and applying for the no cost extension. Darin Cecil led a training on budget procedures.

Institute Advisory Board Meeting

The Institute Advisory Board met in the Spring of 2023 virtually. In attendance were representatives from all institutions in the alliance. President Capilouto, Dr. Kelly Bradley, Dr. Johné Parker, and Julie Bradley led the meeting. The meeting reviewed past successes, shared leadership meeting highlights, response to the external evaluator recommendations, updates on how to report scholar level data, no cost extension, and the research study.

Virtual Monthly Drop-In Director/Coordinator Meetings

Two monthly drop-in virtual meetings between Alliance leadership for the lead institution and alliance partners has been established. These meetings cover any questions the partners have, focus on budget updates, and build community.

Virtual Monthly Campus Coordinator Best Practice Meetings

Monthly Campus Coordinator Best Practice meetings were established during the summer of 2023. Campus coordinators take turns leading the meeting based on needs/interests for implementing LSAMP programing, support and building community.

Virtual Monthly Symposium Planning Committee Meetings

Starting in summer 2023, the Alliance will create the first Symposium Planning Committee. This committee is made up of alliance directors, coordinators, and scholars.

Annual Project Evaluation: External Review

2022 Evaluator Recommendations Response

1. 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.
    - *Status: Ongoing*
        - 2 Monthly drop-in virtual meetings between Alliance leadership for the lead institution and university partners have been established. These meetings cover any questions the partners have and focus on budget updates.
        - Monthly best-practice meetings between campus coordinators has been established
        - Virtual Symposium planning committee which includes student representation has been established.
2. 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.
    - *Status: Ongoing*
        - Monthly virtual best-practice meetings between campus coordinators has been established
        - Re-established the annual campus coordinator meeting
        - Hosted best practice campus coordinator break-out sessions at the symposium
3. 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.
    - *Status: In progress*
        - We have requested this information from NSF and have not received confirmation.
4. Mentors called for campus coordinators to reach out to high school teachers to assist in identifying and encouraging LSAMP eligible students to apply.
    - *Status: Ongoing*
        - This varies from campus to campus and is an agenda item for the upcoming year for the monthly coordinator best practice meeting.

        - Continuing to share opportunities, including inviting high school students and teachers to the symposium.
5. 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.
    - *Status: Ongoing*
        - This varies from campus to campus and is an agenda item for discussion for the best-practice campus coordinator meetings for the upcoming year
        - PIs are encouraging campus coordinators to participate in student orientation events and to network across organizations on campus
6. The Alliance should do more to build a community of mentors and within and across partner institutions.
    - *Status: Ongoing*
        - The community colleges have been matched with local 4 year institutions and together they are making an action plan to participate more fully together in activities, research, and events.
        - This is a topic for upcoming campus coordinator best practice meetings.
7. Consider formally recognizing mentors' contributions by providing letters of support for promotion and tenure as well as merit raises.
    - *Status: Ongoing*
        - Currently, only one coordinator has asked for this kind of support and the Acting Director provided a letter of recommendation for them.
        - Creating these templates and other letters of support is in progress.
8. 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.).
    - *Status: Ongoing*
        - This is an ongoing action item as we bring in new members and remind current members.
        - In addition to individual campus activities to promote an understanding of the origin of LSAMP, this information is included on the updated website.
        - This is a topic of discussion for the upcoming monthly campus coordinator meetings
9. Scholars continue to report that they do not evaluate LSAMP staff (except through the external evaluators' assessment).
    - *Status: Ongoing*
        - This was discussed at the PI meeting and it was clear that the partners felt external evaluation was sufficient. During the upcoming year, the team will inquire about how scholars would like to evaluate this.
10. A majority of mentors report that they have not undergone formal orientation for LSAMP.
    - *Status: Ongoing*
        - Alliance-wide mentor training was offered virtually. We will continue to offer this at least one time per semester.
        - Discussion is underway to create an asynchronous training to onboard new mentors.

11. 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.
    - *Status: Ongoing*
        - Communication can always be improved upon. Steps taken to improve communication include:
            - The UK co-PIs offer drop-in meetings twice per month.
            - A shared email listserv was established to share out information (this is not just one way, any member of leadership can post on it)
            - The alliance-wide website was updated and now includes a newsfeed for scholar opportunities.
            - We have established a monthly campus coordinator best practice meeting
            - We have established a symposium planning committee
            - We have re-established the annual director/coordinator's meeting
12. 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.
    - *Status: Complete*
        - Members of the research team have been clearly defined.
13. 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.
    - *Status: Complete*
        - Level one and Level two scholars have been clearly defined across the institutions.
        - UK's IRAD (Institutional Research and Analytic Decision) compiles and reviews all data for accuracy.
14. 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.
    - *Status: Complete*
        - All Amazon cards have been distributed.

Executive Summary of External Evaluation

(The external evaluation in its entirety can be found in the appendix.)

The KY/WV Alliance for Louis Stokes Alliance for Minority Participation (LSAMP) aims to build on achievements of its Phase II award by further enhancing the participation of

historically underrepresented racial/ethnic minority (HURM) populations in STEM-related academic majors and careers; implementing virtual platforms to foster a stronger sense of community among LSAMP participants; and enhance sharing of resources among partner institutions. Scholars consistently report that the major value of LSAMP is to provide academic, social, and emotional support for Scholars, as well as platforms for exchanging ideas, information, and resources among members of the STEM workforce.

Methodology. Data were collected using a mixed methods (quantitative and qualitative) approach. From 2019-2022, the lead evaluator and the Program Director (PD) selected annually three KY/WV Alliance institutions of varying Carnegie classification, geographical location, and student demographic composition for case and cross case analysis for in-person visits—except for virtual visits during the COVID-19 restrictions. This summative evaluation plan called for data collection using a mixed methods approach—quantitative and qualitative. To maximize participant anonymity and confidentiality, institutions were *identified as A, B, and C in reports*. Quantitative data were collected using e-surveys (both 5-point Likert-scaled items and open-ended items). Beginning in 2020, evaluators no longer administered e-surveys because the independent Research Study was surveying the same Scholars resulting in survey saturation. This resulted in unacceptable response rates for statistical analysis. Below is a summary of the highlights of the major findings of both the formative and summative evolutions.

Highlights of Findings.

Accomplishments.

- Research Study. With the addition of a new Co-PI with expertise in survey methodology, data collection appears to be overcoming the previous challenges of low participation resulting in response rates adequate for analysis.

- Website. Redeveloped in accordance with previous and persistent recommendations from the evaluator—specifically, there is a biographical profile of Congressman Louis Stokes, eponymic recognition in naming the National Science Foundation's LSAMP Program. This is important because both students and non-students lacked knowledge of Louis Stokes. Regular weekly times were scheduled for the partners to post on the website.

- Fall Retreat. This event is a mainstay of the partners' input fostering a sense of community among Alliance partners. Provides space for sharing information, ideas and resources and building a community of diverse STEM professionals.

- PI Engagement. The PI, President of the University of Kentucky, convened the presidents of the partner institutions via Zoom. Additionally, the PI presented greetings at the Spring 2023 Symposium and interacted with Scholars, Coordinators, and guest speakers.

- Symposium. This event provides opportunities to build and sustain a community of diverse STEM Scholars. Also, it provides platforms for exchanging ideas, information, and resources among members of the STEM workforce. Relatedly, Scholars are exposed to STEM professionals, as well as to a variety of options and opportunities in the STEM and Skilled Technical (ST) workforces.

Alliance leadership was able to find external support to purchase and distribute the Alliance tee shirts at the 23rd LSAMP symposium, which should enhance LSAMP visibility on campuses.

Areas of Concern

Communication.

A. Instead of an alliance, partner institutions continue to act as silos. The lack of communication among *all* partner institutions continues to be a perennial complaint. Institutions convene for retreats but then nothing happens; the interviewees say that the Co-PIs have not taken a leadership role to make this happen.

B. Partners need to be proactive in sharing with one another information about best practices, STEM-related conferences, internships, and funding opportunities.

C. In the current funding cycle, it was proposed that the Alliance would establish a virtual cyber-environment to enhance community and sharing resources among faculty, and Scholars; it has not yet been fully realized.

Lack of Diversity.

A. Lack of racial diversity among leadership (only 1 in 4 identifies as a racial minority). Among leadership only two of the four Co-PIs have doctorates in STEM fields recognized by NSF.

B. Symposium:

1. Interviewees recommend that in the future more intentional efforts be made to address the concerns about lack of race/ethnicity diversity among LSAMP leaders, speakers and LSAMP program student receptionists.

2. Lack of full-time Project Director with experience in managing an LSAMP program.

C. Need to develop and implement a strategic plan to enhance the number of STEM tutors and mentors, especially collaborations among research-focused and teaching-focused partners.

D. Need for all partner institutions to be more engaged in attending and actively participating in Alliance meetings, event and volunteering for tasks that benefit the collective.

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://kynsfepscor.uky.edu/

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 Website, https://kywvlsamp.uky.edu/ was completely overhauled this year. It has been updated

to link directly to partner institutions' websites, identify key personnel, celebrate Louis Stokes, access reports, and provide resources for Scholars, faculty mentors, and program staff.

In addition to updating the website, the KY WV LSAMP program now utilizes Microsoft Office for listserv communications to leadership, scholars and other partners. This listserv is 2-way, information can be share by all participants.

There continue to be plans for Co-PI's, campus coordinators, and the campus directors 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 2022-23 dissemination includes:

KY-WV LSAMP Scholars Celebrated at UK Symposium by Lindsay Travis, was published in UKNow on May 2, 2023.

Bradley, K., Bradley, J., Teirney, T. & Parker, J. (In process). What's your story? LSAMP Scholars share the impact of their experiences in the LSAMP program in their own words.

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/feduc.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.

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.

Dr. Kelly Bradley of the University of Kentucky had several notable accomplishments that include the following publications and presentations:

Niu, C., & Bradley, K.D. (Under review). Comparing two statistical methods for validating rater- mediated performance assessments: A research note. Journal of Survey Statistics and Methodology.

Niu, C., Bradley, K.D., & Mohr-Schroeder, M. (Under review). Rate to measure mathematics teaching: Using many-facet Rasch modeling to re-validate the Mathematics Classroom Observation Protocol for Practices (MCOP2). Journal for Research in Mathematics Education.

Flowers, R. & Bradley, K.D. (Accepted with revisions) Pray and Play: The Impact of Fellowship of Christian Athletes on Spiritual Development, Belonging, and Coping for African American Collegiate Football Players. Journal of Athlete Development and Experience.

Peabody, M., Sampson, S.O., Bradley, K.D., Ayoob, A., Investigating rater bias in Objective Structured Clinical Examinations under a Many-Facet Rasch model framework (April, 2023) American Educational Research Association Annual Meeting, Chicago, IL.

Flowers, R. & Bradley, K.D. Pray and Play:Fellowship of Christian Athletes Impact Among Kentucky African American Collegiate Football Players (April, 2023) American Educational Research Association Annual Meeting, Chicago, IL.

Dr. Kelly Bradley lead or took part in multiple professional development, mentor, sponsored projects, national presentations and research opportunities that included:

- Sponsoring Professor and Chair of Amy Jones Haug, 2023 UNITE Postdoctoral Scholar. Note: UNITED IN TRUE RACIAL EQUITY (UNITE) was established as part of the University of Kentucky's

Diversity, Equity, and Inclusion Master Plan (August 2020) to bring together diverse groups of investigators, trainees, colleges, and research groups with a focus on research surrounding equity.

- Participant, National Academies – Sciences, Engineering, Medicine. We've Broken Through the Glass Ceiling and We're Still Getting Cut: A Workshop on Women in Leadership (attended virtually). 08/02/2023, 9am-2pm (PST).
- Participant, The Chronicle of Higher Education. Strategic Leadership Program (attended virtually). 06/2023. https://www.chronicle.com/professional-development.
- Chaired 5 Doctoral, PhD, students that completed dissertations, including four Ed Sciences and one from our Higher Education Diversity, Equity, Inclusiveness strand.
- Supervisor and Advisor of Odunayo Motilewa, selected as a scholar for the 2023 UNITE Predoctoral Research Enhancement Program.
- 1/2023-12/2027. US Department of Education. Kentucky's Statewide Full-Service Community Schools Program. Co-I – 6.25%. (Evaluation Funds: $2,202,628).
- 9/2022-8/2023. College of Medicine Psychometrics. Internal UK Funding. ($62,000)
- Peabody, M., Sampson, S.O., Bradley, K.D., Ayoob, A., Investigating rater bias in Objective Structured Clinical Examinations under a Many-Facet Rasch model framework (April, 2023) American Educational Research Association Annual Meeting, Chicago, IL.

Flowers, R. & Bradley, K.D. Pray and Play:Fellowship of Christian Athletes Impact Among Kentucky African American Collegiate Football Players (April, 2023) American Educational Research Association Annual Meeting, Chicago, IL.

Dr. Johné Parker, of the University of Kentucky, had several academic and professional accomplishments:

- Appointed as Acting Associate Dean, DEI and Chief Diversity and Inclusion Officer for the Stanley and Karen Pigman College of Engineering, November 2022.
- Pigman College of Engineering selected as NACME (National Action Council for Minorities in Engineering) Partner Institution via approved 2024-2028 NACME

- Block Grant Award submitted March 2023.
- Selected as one of 17 Cohort 1 stEm PEER (Practitioners Enhancing Education Regionally) Fellows with the Engineering PLUS (Partnerships to Launch Underrepresented Students) Eddie Bernice Johnson INCLUDES Alliance (NSF HRD-2119930).
- The Engineering PLUS Alliance, funded at $10 million over 5 years, is one of 17 National Science Foundation (NSF) INCLUDES Alliances of higher education institutions and the only Alliance focused on engineering.

Dr. Parker also had several research publications and presentations:

Babaei A, Parker J, Moshaver P, 2022, Adaptive neuro-fuzzy inference system (ANFIS) integrated with genetic algorithm to optimize piezoelectric cantilever-oscillator-spring energy harvester: Verification with closed-form solution. Comput Eng Phys Model, Volume 5, Issue 4, pp 1–22.

Babaei A, Parker J, Moshaver P, 2023, Elastically Restrained Cantilever Oscillator: Nonlinear Transcendental Characteristic Equation and Vibration Characteristics in Free and Forced Vibrations, SN Applied Sciences, under review.

Babaei A, Parker J, Moshaver P, 2023, Optimizing piezoelectric vibration-based energy harvester using numerical-analytical method and soft computing algorithms (ANFIS and Genetic Algorithms), Journal of Vibration Engineering & Technologies, under review.

Love, J. O., Duggans, C. J., Isaacs, J. A., Parker, J. M. and Norris, K. M., 2023, stEm Peer Academy: Building a Community of Practice, 5th Annual ASEE Collaborative Network for Engineering and Computing Diversity (CoNECD) Conference, New Orleans, February.

Dr. Bruce Rodenborn, Associate Professor at Centre College, and mentor to Brianna Tilley, presented at the American Physical Society's Division of Fluid Dynamics Meeting 2022 and the American Physical Society's March Meeting 2023.

Leonardo, M., Brunty, S., Huffman, J. *et al*. Effects of isolation housing stress and mouse strain on intravenous cocaine self-administration, sensory stimulus self-administration, and reward preference. *Sci Rep* 13, 2810 (2023). https://doi.org/10.1038/s41598-023-29579-9

Dr. Luke Bradley, Professor and Acting Chair of the Department of Neuroscience at the University of Kentucky and mentor to LSAMP Scholars, Emily Guerro, Lordina Mensah, and Andrea Hernandez, was recognized for being re-nominated for UK Undergraduate Mentor of the Year 2023. (This is a once in a lifetime award, Dr. Bradley was previously awarded this honor in 2018.)

Dr. Luke Bradley was awarded the University of Kentucky (UK) Neuroscience - Postbaccalaureate Research Education Program (**UKNeu-PREP**), one of six inaugural nationally-funded programs from NINDS dedicated to recruit and retain underrepresented minority post baccalaureate, from institutions without doctorate programs, to pursue graduate degrees in neuroscience.

Dr. David Miller, Professor & Co-Pi KY WV LSAMP, of West Virginia University, published several articles regarding mindset, inquiry based learning and active learning in mathematics:

- Miller, D., Case, J., & Davies, B. (2022; online). 'Introduction to Proof' students' beliefs about empirical arguments and mathematical proof. International Journal for Mathematics Education in Science and Technology.
- Deshler, J., Fuller, E., & McEldowney, T., Miller, D., Pascal, M., Stewart, J. (accepted). Case Study of an Emerging Scholars Program at a Predominately White Institution: Analyzing the Success of Underrepresented Students in an Inquiry-Based Calculus Sequence. Justice Through the Lens of Calculus, 215.
- Miller, D., and Schraeder, M. (2022). Worked example mid-semester intervention in College algebra. REDIMAT –Journal of Research in Mathematics Education,11(2), 140-158. Miller, D. A., & Schraeder, M. (2022). Using worked examples with active learning in a large lecture college algebra course. International Journal of Education in Mathematics, Science, and Technology (IJEMST), 10(1), 1-23. https://doi.org/10.46328/ijemst.2011 https://doi.org/10.17583/redimat.9645

Associate Professor Jeremy Dawson of West Virginia University, mentor to LSAMP Scholar Amirah Mitchell, presented at two workshops:

- P. Aghdaie, B. Chaudhary, S. Soleymani, J. Dawson, and N. Nasrabadi, “Morph Detection Enhanced by Structured Group Sparsity,” accepted for presentation at WACV 2022 -
- Workshop on Manipulation, Adversarial, and Presentation Attacks in Biometrics, Waikoloa, HI, USA, Jan. 4-8, 2022.

WVU Professor and Hazel Ruby McQuain Chair for Neurological Research, Randy Nelson, and mentor to LSAMP Scholar Taya Sullivan, published or submitted the following:

- Walker II, W.H., Meléndez-Fernández, O.H., Becker-Krail, D.D., & Nelson, R.J. 2022. Neuroendocrine-immune system interactions. Biological Clocks and Immune Function, Eds. (In press).
- Nelson, R.J. 2022. Frank A. Beach. In Biographical History of Behavioral Neuroendocrinology. R.J. Nelson and Z.M. Weil (editors). Springer Nature (In press).
- Nelson, R.J. & Weil, Z.M. Arnold Berthold. In Biographical History of Behavioral Neuroendocrinology. R.J. Nelson and Z.M. Weil (editors). Springer Nature (In press).
- Bumgarner, J.R., Becker-Krail, D.D., White, R.C., & Nelson, R.J. 2022. Deep learning tools for the foundational study of pain and opioid use disorder. Frontiers in Neuroscience (In press).
- Walker, W.H., Liu, J.A. & Nelson, R.J. 2022. Disruptions of circadian rhythms and sleep/wake cycles in neurologic disorders. In: Sleep and Clocks in Aging and Longevity. ed. Anita Jagota. (In press).
- Liu, J.A., Walton, J.C., Bumgarner, J.R., Walker, W.H., Meléndez-Fernández, O.H., DeVries, A.C., & Nelson, R.J. 2022. Chronic exposure to dim light at night disrupts immune function and decreases longevity in aged female mice. Chronobiology International. (Under review).
- Chbeir, S., Russart, K.L.G., Walker II, W.H., Proca, D.M., Madhu, P., Fitzgerald, J., DeVries, A.C., & Nelson, R.J. 2022. Disruption of endogenous circadian rhythms by exposure to light at night accelerates pancreatic tumor growth in mice. Cancer Research. (Under review).

WKY Professor Hung-Liang Chen, mentor to LSAMP Scholar Nathaniel Dunbar, published the following articles:

- Leon, G. and Chen, H. L. (2022), Estimation of Early-Age Tensile Stresses in Mass Concrete Containing Ground Granulated Blast Furnace Slag, Journal of Materials in Civil Engineering, ASCE, Volume 34, Issue 5, pp.1-16 (04022069), May 2022. https://doi.org/10.1061/(ASCE)MT.1943-5533.0004195.
- Yikici, A., Sezer, H., Chen, H-L. (2022), Modeling Thermal Behavior of Mass Concrete Structures at Early Age. Transportation Research Record: Journal of the Transportation Research Board, 2022;2676(6):536-548, February 2022. https://doi.org/10.1177/03611981221075626.

Assistant Professor Margaret Bennewitz, mentor to WVU's LSAMP Scholar Alexia Gorman, published the following articles:

- Snoderly HT, Freshwater KA, Martinez de la Torre C, Panchal DM, Vito JN, Bennewitz MF*. PEGylation of metal oxide nanoparticles modulates neutrophil extracellular trap formation. Biosensors, 2022. 12(2): 123. *Senior author. Link to article.
- Snoderly HT, Nurkiewicz TR, Bowdridge EC, Bennewitz MF*. E-cigarette use: device market, study design, and emerging evidence of biological consequences. International Journal of Molecular Sciences, 2021. 22(22): 12452. *Senior author. PMID: 34830344.

Scholar Highlights

Centre College

Brianna Tiley presented at the 75th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, *Calibrating numerical simulations with macroscopic bacterial models,* https://meetings.aps.org/Meeting/DFD22/Session/S01.7

Nathan Vela presented their project, *Ruthenium(II) polypyridyl complexes with attached NSAIDs as potential dual mechanism of action therapeutics*, at the 2023 Spring American Chemical Society National Meeting and 2023 Centre College RICE Symposium.

In March 2023, **Temiloluwa Haastrup** attended the 2023 Spring American Chemical Society National Meeting.

In Spring 2023, **Kai Oddo** presented at the Spring American Chemical Society National Meeting, the KY WV LSAMP Symposium, and Centre College's RICE Symposium on their project, *Ruthenium(II) polypyridyl complexes with attached NSAIDs as potential dual mechanism of action therapeutics*. **Kai Oddo** was also the presenting author, along with Temiloluwa Haastrup and Sarah Tahanasab (non LSAMP co-author) at the Undergraduate Poster Presentation at the University of Kentucky College of Engineering Undergraduate Innovations in Research Symposium in March 2023 with the poster: *Paper-based assay for the detection and quantification of superoxide dismutase in human serum*.

Marshall University

LSAMP Scholar **Alisha Althea** of Marshall University was selected to participate in the Cyber Defense "Locked Shields" Exercise.

Kentucky State University

Kentucky State University Scholars visited the BCTC Cybersecurity Education Diversity Initiative (CEDI) to the Supercomputer / Data Center at the University of Kentucky (UK).

University of Louisville

Farhiya Awale submitted their Co-Op Report to the Faculty of the Department of Bioengineering at the University of Louisville J.B. Speed School of Engineering in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Bioengineering while being a Direct Service Volunteer and Advocate at The Center for Women and Families & Patient and Family Ambassador at Norton Children's Hospital and Bioengineering Co-Op at American Printing House for the Blind.

Amani Ikram, while working toward their Neuroscience degree, serves as a REACH Spanish tutor at the University of Louisville Learning Resource Center in addition to Research at the Pediatric Research Institute (PRI) and volunteering at the UofL Hospital ER.

UofL's **Lily Hoang** was selected as a Reach the World: Global Exchange Scholar.

Jonathan Hebron completed his honors thesis, *Biol 405 (Undergraduate Research - CUE): Comparing fossils (mammalian and nonmammalian) located in the late Cretaceous locality of Anfiteatro in South America to the known existing distribution of species/taxa in this time period*, Honors Department of UofL.

Haven Fabrielle Romero submitted the abstract: *Should Clinical Ethicists Use Direct Quotations in Chart Notes?*

UofL's **Karen Gwandi** was adopted into The Society of Porter Scholars.

Marianna Rodriguez participated in the KY-IBBRE Workshop and served as a volunteer to the KY Refugee Ministries.

Sofia Ariza Granados became a member of the Collegiate Neuroscience Society.

Stephen Gonzales participated in research in UofL's Aging & Neuropsychology Lab, served as a REACH Learning Center PSYC 201 PAL Facilitator, was a member of Phi Delta Theta, RaiseRED, and the University Honors Program.

Tashiana Walker paid-it-forward by serving as a Physics and Astronomy Volunteer for Admitted Students Day.

Veenasravani Pendyala conducted research in the Microbiology and Genetics Department at the UofL Health Sciences Campus on genetic sequencing using the FLAIRR-Seq method.

Western Kentucky University

Isaiah Alvarez presented at the 2023 WKU Undergraduate Research Conference: "Investigating T1 and T2 Relaxation Times in NMR: A Comparison of De-Ionized and Doped Water".

The article, “A Novel Approach to Nowcasting Solar Flare Events Using Multi-wavelength SDO/AIA Data” was published by authors Paolo Massa, A Emslie, Ivan Novikov, Lars Hebenstiel, Jake Boils, Ethan Poore, **Isaiah Alvarez,** Hudson Harner, Leah Hartmann, Sabrina Guastavino, Francesco Marchetti, Valentina Candiani, Federico Benvenuto, Michele Piana, Cristina Campi.

Femi Obielodan participated in the National Society of Black Physicists and the American Astronomical Society Conferences.

Gabe Heckerman presented at the following meetings:

Heckerman, G.*, Smith, M.E. 2022. The protective role of melanin in the *Poecilia latipinna* inner ear. Western Kentucky University Student Research Conference, Bowling Green, KY. Poster Presentation.

Heckerman, G.*, Smith, M.E. 2022. The protective role of melanin in the inner ear of two fish species, *Poecilia latipinna* and *Cyprinus carpio*. Annual Meeting of the Kentucky Academy of Science, Morehead State University, Morehead, KY. Poster Presentation.

West Virginia State University

WVSU’s **Heavan Smith, Desirae Ledesma, Jafet Hernandez, and Ameris Chadband** presented at the WVSU Summer Undergraduate Research Symposium.

Heavan Smith, Desirae Ledesma, Jafet Hernandez, and Ameris Chadband represented well at the WV Undergraduate Research Day at the Capitol.

West Virginia University

Alexa Gorman participated in the 2022 LSAMP Regional Conference.

Many of WVU’s LSAMP Scholars participated in summer research, including: **Alexa Gorman, Amirah Mitchell, Maria Rincon-Perez, Taya Sullivan, Nathaniel Dunbar, Chloe Hernandez, and Heriberto Perez.**

University of Kentucky

Katherine Delgado from the University of Kentucky in addition to presenting at the KY WV Symposium, presented Responsible Conduct of Research Presentation.

Daniela Jackson, from the University of Kentucky participated in the National Conference of Undergraduate Research.

Emily Guerro, Lordina Mensah, and **Andrea Hernandez,** mentored by Dr. Luke Bradley, presented at the 2023 KY-WV LSAMP Symposium and the National Conference of Undergraduate Research, “The Symphony of the Cell: Data Sonification”.

Lordina Mensah was named a 2024 Chellegran Fellow and awarded the *Patti Grace Smith Fellowship, Empowering Black Excellence in Space*.

Lordina Mensah was accepted into the National Society of Black Engineers, served as a START mentor, and organized an outreach event for middle schoolers interested in STEM.

References

https://www.nytimes.com/2023/08/18/us/west-virginia-university-budget-cuts-deficit.html

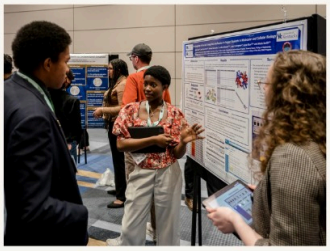
https://www.chronicle.com/article/the-shrinking-of-higher-ed

Appendix


LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION KY • WV
2023 KY WV LSAMP Symposium
Supporting Underrepresented Undergraduate Populations in STEM
RegisterToday!
The KY WV LSAMP Symposium showcases the work of the KY WV LSAMP Scholars and Mentors.
Poster Sessions
Keynote Speakers
Presentations
Workshops
Networking
Graduate School Fair
Informative Sessions
And More!
Where: University of Kentucky Gatton Student Center
When: Friday, March 31, 2023 4:00 p.m. -10:00 p.m. est & Saturday, April 1, 2023 8:30 a.m.-4:00 p.m. est
Call for Posters
KY WV LSAMP scholars are invited to present their undergrad reseach. We want to celebrate you! Submit your abstract through the registration link.
More Info:
www.kywvlsamp.uky.edu
The KY WV LSAMP Symposium is made possible with the support of the National Science Foundation Award #HRD 1826763.

LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

KY ★ WV



LSAMP's mission is 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.

Benefits

- Financial support
- Research support
  - Connect with labs at UK
  - Faculty mentorship
  - International research opportunities
- Academic skills development
- Peer mentoring
- Grad school prep and application support
- Networking with professionals and peers

Qualifications

- US Citizen or Permanent Resident
- Identify as Underrepresented Minority Student (Black/African American, Hispanic/LatinX, Native American/Alaskan, or Pacific Islander)
- Maintain full-time enrollment in approved STEM Major (see website for eligible majors)
- Maintain a 3.0 GPA
- Demonstrate intent in pursuing graduate degree in a STEM field

Learn more on our website!

KY-WV LSAMP is funded by the National Science Foundation under Grant No. 1826763

2023 KY WV LSAMP Symposium Program and Agenda

Friday, March 31, 2023, @ UKY ESPORTS Lounge	
4:00 p.m. -5:00 p.m.	Check-in / Gaming room open to play
5:00 p.m. - 5:15 p.m.	Welcome: Dr. Johné Parker and Dr. Kelly Bradley
5:15 p.m. -6:00 p.m.	Ice Breaker: Led by the Transformative Learning Team
6:00 p.m. -7:00 p.m.	Dinner
7:00 p.m. - 8:00 p.m.	Introduction: Dr. Johné Parker **Keynote: Dr. Carlotta Berry**
8:00 p.m. - 10:00 p.m.	Esports Gaming Esports is open until midnight. LSAMP Scholars are welcome to play longer if they wish. The general public will be allowed to use the facility starting @ 10:00 p.m.
If only attending Friday Night, please complete the feedback survey. If attending both Friday and Saturday, please wait to complete the survey at the conclusion of the symposium. **2023 KY WV LSAMP SYMPOSIUM FEEDBACK SURVEY**	

Saturday, April 1, 2023, @ UKY Gatton Student Center
8:00 a.m. - 8:30 a.m. **Gatton Student Center Grand Ballroom A/B**
Check-in/Breakfast
8:30 a.m. - 9:00 a.m. **Gatton Student Center Grand Ballroom A/B** **& Live Streamed**
Introduction: Kelly Bradley, Ph.D., KY WV LSAMP Co-Principal Investigator **Welcome:** President Capilouto, KY WV LSAMP Principal Investigator
9:00 a.m. - 10:00 a.m. **Gatton Student Center Grand Ballroom A/B** **& Live Streamed**
Introduction: Johné Parker, Ph.D., KY WV LSAMP Co-Principal Investigator **Keynote Speaker:** Emmanuella Bassey University of Texas at Austin France International Research Student Speaker

10:00 a.m. - 10:15 a.m.

Break

10:15 a.m. - 11:45 a.m.
Gatton Student Center Grand Ballroom A/B

Scholar Poster Sessions
See abstracts below
Please provide the scholar feedback here: Poster Feedback Survey

Academic Fair
See participant list below

LSAMP Breakout

Room: GSC 330 E Classroom	**Room:** GSC 330 D Classroom	**Room:** GSC Grand Ballroom A/B & Live Streamed
For LSAMP Leadership: Questions about your budget? Meet with Darin Cecil, Financial Officer	**Evaluation Interviews** Pre-selected participants meet with Dr. Willie Pearson for KY WV LSAMP	**NICE Speaker Denise Yates, MSEd.** For LSAMP Leadership: Learn about settin up your student for international experiences. For LSAMP Scholars: Learn about international research experiences.

11:45 a.m. - Noon

Break

Noon - 1:00 p.m.
Gatton Student Center Grand Ballroom A/B

Networking Lunch

1:00 p.m. - 1:50 p.m. Concurrent Sessions
Concurrent Session Descriptions Below

Room: GSC Grand Ballroom A/B	**Room:** GSC 331 Classroom	**Room:** GSC 330 AB Classroom	**Room:** GSC 375 Executive Boardroom	**Room:** GSC 330C SEC Mtg. Room	**Room:** GSC 330 D Classroom
Conversations about Graduate School *Moderated by Dr. Johné Parker, Assoc. Professor, Acting Associate Dean for DEI, College of Engineering, Co-PI KY WV LSAMP*	***Turning your work into a Conference Presentation and /or Publication*** *Led by Dr. Kelly Bradley, Professor, Department Chair, UK College of Education, CO-PI of UK-WV LSAMP*	***The Scholar's Guide to Time Management: Achieve More and Stress Less*** *Led by Molly McAndrew, Integrated Success Coach/START Teaching Assistant*	***Professional Development Begins on Day One: From Crafting Your First Resume to Interview Prep to Evaluating and Negotiating Full Time Job Offers*** *Led by "Betsy" Elizabeth A. Davies, J.D. Associate Director for Career Development and Employer Relations UK Engineering Career and Co-op Center*	***LSAMP Leadership: Best Practices: Using Active Learning Strategies and Canvas with your Cohort*** *Led by Trevor Tierney, Integrated Success Coach, UK Acting Campus Coordinator for UK KY WV LSAMP*	**Evaluation Interviews** Pre-selected participants meet with Dr. Willie Pearso for KY WV LSAMP

2:00 p.m. - 2:50 p.m. Concurrent Sessions
Concurrent Session Descriptions Below

Room: GSC Grand Ballroom A/B	**Room:** GSC 331 Classroom	**Room:** GSC 330 AB Classroom	**Room:** GSC 375 Executive Boardroom	**Room:** GSC 330C SEC Mtg. Room	**Room:** GSC 330 D Classroom
Conversations about Graduate School *Moderated by Dr. Johné Parker, Assoc. Professor, Acting Associate Dean for DEI, College of Engineering, Co-PI KY WV LSAMP*	***Turning your work into a Conference Presentation and /or Publication*** *Led by Dr. Kelly Bradley, Professor, Department Chair, UK College of Education, CO-PI of UK-WV LSAMP*	***The Scholar's Guide to Time Management: Achieve More and Stress Less*** *Led by Molly McAndrew, Integrated Success Coach/START Teaching Assistant*	***Professional Development Begins on Day One: From Crafting Your First Resume to Interview Prep to Evaluating and Negotiating Full Time Job Offers*** *Led by "Betsy" Elizabeth A. Davies, J.D. Associate Director for Career Development and Employer Relations UK Engineering Career and Co-op Center*	***LSAMP Leadership: Best Practices: Using Active Learning Strategies and Canvas with your Cohort*** *Led by Trevor Tierney, Integrated Success Coach, UK Acting Campus Coordinator for UK KY WV LSAMP*	**Evaluation Interviews** Pre-selected participants meet with Dr. Willie Pearson for KY WV LSAMP

3:00 p.m. - 3:15 p.m.
Gatton Student Center Grand Ballroom A/B

Final Remarks by the Co-Pi's

3:30 p.m. Depart

Thank you for attending! Travel Safe!

PLEASE COMPLETE THE FEEDBACK SURVEY:
2023 KY WV LSAMP SYMPOSIUM FEEDBACK SURVEY

About Our Keynotes

Denise Y. Yates, Senior Research Scientist at the University of Texas El Paso, was selected as a 2022-2025 Fulbright Specialist. In her role as a Fulbright Specialist, Denise traveled to France to engage in her first Specialist project to build strategic relationships with French national science education administration, local government education officials, and higher education institutions to explore the feasibility of an international student research exchange program for underrepresented students in STEM.
The immersive experience resulted in the development of an 8-week pilot student research exchange program that will be launched in the Summer of 2023. The LSAMP International Center of Excellence (LSAMP-NICE), in partnership with Universite Toulouse III-Paul Sabatier, will facilitate the opportunity for 20 LSAMP students to participate in the pilot internship program to conduct scientific research in various STEM disciplines at the University of Toulouse, and 10 Master's level French students to come to the U.S. to conduct research at U.S. institutions.

Emmanuella Bassey is a senior Neuroscience major and French minor on the pre-medical track at The University of Texas at Austin. Through the avenue of LSAMP, Emmanuella conducted neuroscience research at the Paris Brain Institute (Institut du Cerveau) in the summer of 2022. In the lab of Dr. Jaime De Juan Sanz, she studied the electrical excitability of cancerous brain cells and created various molecular tools to test the functionality of cellular proteins. Following graduation, Emmanuella plans to continue exploring the world of research through pursuing a Master's degree at the Université de Toulouse III - Paul Sabatier.

Dr. Carlotta Berry's areas of expertise include educational mobile robotics and enhanced human-robot interfaces. Also specializing in recruitment and retention activities for underrepresented populations in electrical and computer engineering, she helped found the Rose Building Undergraduate Diversity (ROSE-BUD) program, which she co-advises. Dr. Berry also helped start and currently co-directs the multidisciplinary robotics program, and is an organizer and judge for FIRST Robotics competitions. One of her recent projects with students involved using mobile robot platforms to remotely command robots to perform tasks. Check out her personal web page.

Concurrent Session Descriptions

Conversations about Graduate School
Scholars will have the opportunity to learn from each other and faculty about the journey to and through graduate school.
Panelists include: Aaron West, Dave-Preston Esoe, Emmanuella Bassey, and Dr. Johné Parker

Turning Your Work into a Conference Presentation and/or Publication
Join Dr. Bradley (EPE Professor & Chair) for a guided discussion, with Q&A on developing your class projects, work projects, and research interests into products that can be disseminated. We will also discuss opportunities to get more involved in research with faculty, research groups, and internships. Come for the entire session or drop in as able!

The Scholar's Guide to Time Management: Achieve More and Stress Less

Looking for ways to achieve more and stress less? Join members of the University of Kentucky's Integrated Success Coaching team to develop an action plan around time management, motivation, and the study cycle. Everyone will leave with their own personalized plan for success!

Professional Development Begins on Day One: From Crafting Your First Resume to Interview Prep to Evaluating and Negotiating Full-Time Job Offers

From crafting the very first resume in college to negotiating full-time job offers, professional development for what comes after graduation can be overwhelming. Join Betsy Davies, Associate Director for Career Development and Employer Relations (UK College of Engineering) to get tips on navigating "career development" as a student.

LSAMP Leadership:
Best Practices: Using Active Learning Strategies and Canvas with your Cohort

Join Integrated Success Coach and UK LSAMP Campus Coordinator to learn more about how to leverage your universities Learning Platform (Canvas, Blackboard, Sharepoint, etc.) and active learning strategies to support your scholars.

Scholar Posters

Please provide the scholar feedback here: ***Poster Feedback Survey***

*Denotes LSAMP Scholar
**Denotes BD Scholar

FUNGI: BUILDING A BETTER WORLD

Jafet Rivera Hernandez*
West Virginia State University, Department of Biology, Institute, WV 25112-1000
West Virginia State University
Funded by: LSAMP and STaR Division
Mentor: Douglas Bright

This work focuses on assessing the structural integrity of varying types of fungal mycelia for the development of myco-blocks. Myco-blocks could provide eco-friendly alternatives to plastic, styrofoam, and possibly even wood. The mycelium used for the myco-blocks was grown in sterile hemp. The fungal species selected were Turkey tail (Trametes versicolor) and reishi (Ganoderma lingzhi) which are in the order Polyporales, and Pearl oyster (Pleurotus ostreatus) and King trumpet (Pleurotus eryngii) which are in the order Agaricales. Once the mycelium had sufficiently spread through the substrate, it was added to the designated mold. After approximately 4 weeks of growth the mold was opened, and the myco-block was allowed to dry. The results gathered were that myco-blocks will have different structural properties when different species of fungi are used. Our preliminary results show that Polyporales provided the greatest structural integrity and was not brittle like the Agaricales.

ANALYZING TRANSIT TIMES OF SAGITTARIUS A* USING OBSERVED AND THEORETICAL DATA

Olufemi Obielodan*
Western Kentucky University
The Gatton Academy of Mathematics and Science
Funded by: LSAMP
Mentor: Dr. Charles McGruder

The Indlebe Radio Telescope (IRT) is a small transit telescope at the Durban University of Technology (DUT). The telescope has a 5 m diameter parabolic reflector which works at a wavelength, λ=21 cm. Daily, the IRT detects Sagittarius A, our galaxy's central supermassive blackhole. There are four determining variables for the time of detection: the right ascension and declination of the radio source as well as the longitude and latitude of the IRT. Because of the

variable positions of the earth's axis of rotation and surface locations as well as earth's non-uniform rotation rate, there are eight additional factors that affect the four variables. The timing Sag A's transit time is influenced by precession, nutation, polar motion, aberration, celestial pole offset, proper motion, length of the terrestrial day, and variable ionospheric refraction. Three of the eight factors are measured quantities– proper motion, polar motion and the length of the terrestrial day. Three other factors can be predicted with a high degree of accuracy– precession, nutation and aberration. However, to date, neither celestial pole offset nor variable ionospheric refraction are predictable. Currently, we are comparing the IRT's observed transit times of Sag A with calculated predications in order to obtain information over these two factors, with a view to better understanding them.

THE PROTECTIVE ROLE OF MELANIN IN THE INNER EAR OF TWO FISH SPECIES, PEOCILIA LATIPINNA AND CYPRINUS CARPIO

Gabriel Heckerman*
Western Kentucky University

Funded by: Mahurin Honors College Honors Development Grant, Western Kentucky University FUSE Grant, QTAG Grant, LSAMP Grant.
Mentor: Dr. Michael Smith, Ph.D.

In combination with aging, exposure to loud sound damages and kills sensory hair cells of the inner ear. Hair cell death ultimately results in hearing loss or deafness due to reduction or halting of neural signal transmission to the brain. There is yet to be a true cure for sensorineural deafness. It has been observed that the lack of melanin pigment produced within melanocytes in mammals is associated with mammalian deafness. Melanocytes are found in the membranous labyrinth and cochlea of mammals. The specific role of melanin in the mammalian inner ear is still unknown, but previous work in the Smith lab suggests that melanin plays a role in protecting fish from noise-induced hearing loss. Many species of fish do have melanin in their inner ear, making them a strong model for hearing loss. We tested the hypothesis that fish with higher concentrations of inner ear melanin would exhibit lower levels of sound-induced hearing loss, suggesting a potential protective role of melanin against sensory hair cell death in the inner ear.

QUALITY VARIATIONS IN THYROTROPIN ALFA

Cristian Samano Garcia*
University of Kentucky
Department of Pharmaceutical Sciences, Lexington, KY, 40506

Funded by: NSF and NIH
Mentor: Robert Lodder

Thyrotropin alfa is a prescription injectable drug containing human thyroid stimulating hormone (TSH). It's used with or without radioactive iodine to identify thyroid disease in patients with a certain type of thyroid cancer. Intra-lot and inter-lot variability in the spectra of Thyrogen® was detected in the Drug Quality Study (DQS) at University of Kentucky, as Fourier transform near-infrared spectrometry (FT-NIR) was used to scan through the bottom of the vials. 11 vials of 30 (36.7%) sampled from lot BY0484 appeared 31.7 multidimensional SDs from the others, suggesting that it represents a different material. Spectra of 30 vials from 4 lots in the spectral library contained 5 vials (16.7% of the total) that were outside the main group (79.6 SDs using a subcluster detection test), suggesting that the 5 library vials also contain differing materials.

PFAS IN KENTUCKY: USING GIS AS A TOOL FOR PREDICTING POTENTIAL CONTAMINATION "HOT-SPOTS"

Ariel Robinson, Sweta Ojha, Dr. Kelly G. Pennell**
University of Kentucky
Lexington, KY, USA

Funded by: KY-WV LSAMP, NSF, NIH, UK Superfund Research Center
Dr. Kelly G. Pennell, University of Kentucky

Per- and poly-fluoroalkyl substances (PFAS) are a group of persistent heterogenous fluorinated compounds. PFAS includes more than 12,000 compounds, which make identification, understanding health risks, and environmental fate and transport challenging. They have been used and manufactured since the 1940s and have strong chemically stable carbon-fluorine bonds, which contribute to their environmental persistence. Studies show that drinking water is an important source of human exposure to PFAS, regardless of whether the drinking water source is publicly supplied. In Kentucky, 95% of Kentuckian's drinking water is provided by public sources; however, there is a need to better understand PFAS exposures in the drinking water. This research developed a screening model as an effective decision aid to assist key decision-makers in identifying and prioritizing sampling locations for potential PFAS exposure risks in the public drinking water sources in their service areas.

RUTHENIUM(II) POLYPYRIDYL COMPLEXES WITH ATTACHED NSDAIS AS POTENTIAL DUAL MECHANISM OF ACTION THERAPEUTICS.

William R. Leach, Kai Oddo*, Nathan Anthony G. Vela*, and Erin Wachter.
Centre College
Danville, KY 40422, U.S.A.

KY-WV LSAMP, Centre College FDC
Dr. Erin Wachter

Phototherapy is a medical treatment that utilizes light to activate the therapeutic effects of drug molecules. The use of phototherapy as a treatment option for cancer is becoming more widespread as many chemotherapeutics have harsh side effects. Non-steroidal anti-inflammatory drugs (NSAIDs) have the possibility of reducing the symptoms of current chemotherapeutics due to their analgesic, anti-inflammatory, and antipyretic properties. Additionally, NSAIDs should have an increased uptake into cancer cells as they bind to cyclooxygenase enzymes (COX-1 and COX-2), which are highly expressed in cancer cells and aid in the progression and growth of tumors. Three sets of ruthenium(II) polypyridyl complexes with NSAIDs attached at different distances from the metal center were synthesized. The antioxidant properties, DNA binding, and the inhibition of the lipoxygenase and acetylcholinesterase enzymes were tested. The data shows promising results for these complexes to potentially be used as dual mechanism light-activated chemotherapeutics.

THE SYMPHONY OF THE CELL: USING DATA SONIFICATION TO ENGAGE STUDENTS IN MOLECULAR AND CELLULAR BIOLOGY

University of Kentucky
Emily Guerrero*, Kayla Horne, Jada Covington, Lordina Mensah*, Lizzie Rice, Andrea Hernandez

Funded by: University of Kentucky S.T.A.R.T. Program and the Chellgren Center
Mentor: Dr. Luke H. Bradley

As technology advances in all aspects of our lives, the demand for careers in science, technology, engineering, and mathematics (STEM) becomes an increasingly critical need. However, many students find STEM challenging, and further lack key experiences, to gain a sense of belonging (and consider a career) in STEM. Thus, providing STEM learning modules that introduce key concepts while engaging students can make an impact in addressing this need. A particularly difficult topic for students to understand is the relationship between cells and how the sequence and structure of proteins ultimately contributes to their function. In order to introduce these basic principles to introductory students, our team has constructed a virtual authentic-learning tool that utilizes data sonification in which each amino acid in a protein sequence is assigned a musical note and rhythmic value based on its hydrophobicity. This allows a harmonious musical piece to be composed based on the sequence of a functional protein. Disease-associated mutations become disharmonious which allows users to auditorily identify disruptions in a protein sequence and understand how it impacts the cellular symphony. We will present our preliminary survey data supporting our hypothesis that this data sonification learning module helps students gain an

understanding of the molecular basis of disease while improving students attitudes towards STEM.

CHARACTERIZING AVIAN COMMUNITY RESPONSE TO TWO DECADES OF URBAN REFORESTATION IN CENTRAL KENTUCKY

Kai Davis**
University of Kentucky

Funding by: Bridge to the Doctorate, KY Ornithological Society, UK INFEWS, & UK Dept. of Forestry

Mentor: John Cox

Urbanization is a growing threat to wildlife globally, although some species have successfully adapted to this type of habitat loss and fragmentation. “Reforest the Bluegrass” (RTB) is a 23-year long environmental initiative in the Lexington, Kentucky metro area numbering over half a million people. The primary goal of the RTB project is to expand Lexington’s urban forest and protect local waterways by planting native trees. This initiative has been beneficial for increasing community awareness of environmental health in and around the city and in building support from the public for broader biodiversity conservation efforts and education; however, there is little information about wildlife use in these plots. Habitat quality for resident and migratory birds is highly dependent on habitat patch size, human disturbance, and landscape context. To better understand the impacts of RTB on wildlife, we are using automatic recording units to record bird calls and the resulting data to model the effects of RTB patch stand characteristics (e.g. age, size, shape) and other potentially influential landscape covariates (e.g. distance to human settlement, distance to urban forest) on bird species occupancy.

LENITION IS SCALAR ACROSS CONSONANT SETS: IMPLICATIONS FOR MENTAL REPRESENTATIONS OF LANGUAGE

Author(s): Taya Sullivan*, Sergio Robles Puente, Jonah Katz
University of Scholar: West Virginia University
Location of Research: West Virginia University, Morgantown, WV, USA

Funding: First2 Network, KY-WV LSAMP, NSF

Mentor(s): Jonah Katz, Sergio Robles Puente; West Virginia University

Abstract: Lenition—that is, the systematic weakening of consonants—is a universal linguistic process which often acts on consonants in weak grammatical (or, in the fields of phonetics and phonology, prosodic) positions. This process has been documented in a wide variety of languages, including Spanish. Previous papers on Spanish lenition have primarily discussed the acoustic nature of /bdg/ voiced stops, and, to a lesser extent, /ptk/ voiceless stops. The present study thus seeks to broadly measure lenition processes in all consonant sets in the Spanish language, grouped based on manner of articulation (that is, configuration of vocal folds, tongue, lips, etc. in producing a particular sound) as follows: /ptk/ voiceless stops, /bdg/ voiced stops, /n/ nasal, /lr/ liquids, /s/ sibilant, and /fθ/ fricatives. To elicit lenition at varying rates, native speakers of the Northern Peninsular and Costa Rican Spanish dialects were recorded reading investigator-constructed sentences aloud in a laboratory environment. Recordings were then analyzed in Praat acoustics software, with particular attention being paid to variation in consonant intensity and duration relative to prosodic environment (in order of low to high: word-medial; word-initial/final; utterance-final; phrase-initial/final; intonation-initial/final). Expected conclusions are that lenition, as defined by a traditional model of phonological features, will be scalar relative to lower prosodic level, that greater lenition will be acoustically indicated by lower-magnitude intensity slopes and thus a shorter duration, and that all consonant classes will exhibit some degree of acoustic lenition processes. Such findings will have implications for the rules that govern our mental representations of language; that is, whether the process of lenition manipulates categorical symbolic representations of sounds (that is, operates along a contrastive model of phonological features) or instead pertains to continuous physical parameters of speech (that is, operates along an acoustic/phonetic model).

Stress Analysis of Mini-Screw Assisted Rapid Palatal Expander using Finite-Element Method

Names: Egon Mamboleo*, Khaled Alsharif, Peter Ngan, and Osama M. Mukdadi
University: West Virginia University
Location: Morgantown, West Virginia
Funding: LSAMP, Frirst2 Network
Mentor: Osama M. Mukdadi, West Virginia University

ABSTRACT The aim of this study is to evaluate the stress response of the soft and hard tissues and the interactions of the surrounding bone of a human skull undergoing clinical loadings generated by miniscrew assisted rapid palatal expander (MARPE) device. The soft and hard tissues under investigation include sutures, periodontal ligaments, and cortical and trabecular bones. The three-dimensional (3D) model of a human skull was segmented through 3D-Slicer, a program that is used for medical imaging and volumetric 3D exportation from CT-scans. Sutures along with the skull's cortical and trabecular bones are refined in Meshmixer and ANSYS SpaceClaim. The full model is imported to ANSYS Mechanical for finite-element analysis. Fixed support boundary conditions are applied at the top and back of the skull. To simulate actuation of the screw mechanism for the MARPE device, a displacement of 0.125 mm was applied on each side (0.25 mm in total) of the MARPE device to represent the displacement caused by one full turn of the jackscrew. The results produced high strains in the regions approximal to the midpalatal suture, and high stresses in the MARPE device itself as expected. The screws experienced stresses of about 270 MPa. The separation of the midpalatal suture deformed in a quasi-parallel forming a trapezoidal shape rather than the undesired "V" shape. The sutures and trabecular bone experienced minimal stresses yet high strain levels. These initial findings constitute a first step towards the validation and development of a clinical pre-operative planning tool for orthodontic advancement.

A DEEP LEARNING APPROACH TO UNDERSTANDING EMOTION

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Funded by: LSAMP, WVU SURE, and First2 Network

Abstract The world as we know it is being changed every day through the implementation of artificial intelligence (AI). These machine-learning-based systems can be trained to perform a variety of tasks, including the potential to detect emotion in face photos or video: emotion-AI. A neural network, a program mimicking the operations of the human brain in decision making, that can detect emotion will help the world's mental health crisis in daily life. This can include road-rage and sleeping while driving. In a typical machine learning/artificial intelligence application, thousands, if not millions, of input data are needed to properly train the program. Then as the program begins to train, a network can detect the proposed category of input data in real time (inferencing). A prototype version of an emotion-AI program will be one of the first steps artificial intelligence can take to inclusively manage our emotions. In the most appropriate time to launch the program, its implementation will help the current innovations in AI, such as the automotive market, with implementing an emotion-AI program. A vehicle may be able to translate to whomever is available to help the driver if crucial events mentioned above were to occur. This same idea should also be the program in a device for conditions like Alexithymia, mostly found in autism. The advantage of having an emotion-AI program includes the ability to increase its parameters as the signs and symptoms of mental health have increasing accuracy with efficient research. For the work presented here, a pre-trained model from a deep learning (neural network) framework called PyTorch was used. This framework was implemented through Jupyter notebook using the Nvidia Jetson-Nano device. Training for this program was limited but was able to translate accuracy and loss with appropriate widgets, so appropriate evaluation could be done.

University of Kentucky S.T.A.R.T. Stem Through Authentic Research & Training High School & Undergraduate Opportunities	**University of Kentucky UKNeu-PREP Graduate Bridge Program** For those with a bachelor's degree considering graduate school in Neuroscience	**Vanderbilt University School of Engineering Graduate Programs**
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University of Kentucky Integrated Biomedical Science Program and Summer Undergraduate Research in Environmental Health	**Univeristy of Kentucky Department of Agricultural Economics Graduate Program**	**University of Kentucky NSF REU in Physics, UK Physics Undergraduate & Graduate Program**
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2023 KY WV LSAMP SYMPOSIUM FEEDBACK SURVEY

External Evaluation

KY/WV Summative Evaluation Report: 2019-2023

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July 25, 2023

Executive Summary

The KY/WV Alliance for Louis Stokes Alliance for Minority Participation (LSAMP) aims to build on achievements of its Phase II award by further enhancing the participation of historically underrepresented racial/ethnic minority (HURM) populations in STEM-related academic majors and careers; implementing virtual platforms to foster a stronger sense of community among LSAMP participants; and enhance sharing of resources among partner institutions. Scholars consistently report that the major value of LSAMP is to provide academic, social, and emotional support for Scholars, as well as platforms for exchanging ideas, information, and resources among members of the STEM workforce.

Methodology. Data were collected using a mixed methods (quantitative and qualitative) approach. From 2019-2022, the lead evaluator and the Program Director (PD) selected annually three KY/WV Alliance institutions of varying Carnegie classification, geographical location, and student demographic composition for case and cross case analysis for in-person visits—except for virtual visits during the COVID-19 restrictions. This summative evaluation plan called for data collection using a mixed methods approach—quantitative and qualitative. To maximize

participant anonymity and confidentiality, institutions were *identified as A, B, and C in reports*. Quantitative data were collected using e-surveys (both 5-point Likert-scaled items and open-ended items). Beginning in 2020, evaluators no longer administered e-surveys because the independent Research Study was surveying the same Scholars resulting in survey saturation. This resulted in unacceptable response rates for statistical analysis. Below is a summary of the highlights of the major findings of both the formative and summative evolutions.

Highlights of Findings.

Accomplishments.

- Research Study. With the addition of a new Co-PI with expertise in survey methodology, data collection appears to be overcoming the previous challenges of low participation resulting in response rates adequate for analysis.

- Website. Redeveloped in accordance with previous and persistent recommendations from the evaluator—specifically, there is a biographical profile of Congressman Louis Stokes, eponymic recognition in naming the National Science Foundation's LSAMP Program. This is important because both students and non-students lacked knowledge of Louis Stokes. Regular weekly times were scheduled for the partners to post on the website.

- Fall Retreat. This event is a mainstay of the partners' input fostering a sense of community among Alliance partners. Provides space for sharing information, ideas and resources and building a community of diverse STEM professionals.

- PI Engagement. The PI, President of the University of Kentucky, convened the presidents of the partner institutions via Zoom. Additionally, the PI presented greetings at the Spring 2023 Symposium and interacted with Scholars, Coordinators, and guest speakers.

- Symposium. This event provides opportunities to build and sustain a community of diverse STEM Scholars. Also, it provides platforms for exchanging ideas, information, and resources among members of the STEM workforce. Relatedly, Scholars are exposed to STEM professionals, as well as to a variety of options and opportunities in the STEM and Skilled Technical (ST) workforces. Alliance leadership was able to find external support to purchase and distribute the Alliance tee shirts at the 23rd LSAMP symposium, which should enhance LSAMP visibility on campuses.

Areas of Concern

Communication.

A. Instead of an alliance, partner institutions continue to act as silos. The lack of communication among *all* partner institutions continues to be a perennial complaint.

Institutions convene for retreats but then nothing happens; the interviewees say that the Co-PIs have not taken a leadership role to make this happen.

B. Partners need to be proactive in sharing with one another information about best practices, STEM-related conferences, internships, and funding opportunities.

C. In the current funding cycle, it was proposed that the Alliance would establish a virtual cyber-environment to enhance community and sharing resources among faculty, and Scholars; it has not yet been fully realized.

Lack of Diversity.

A. Lack of racial diversity among leadership (only 1 in 4 identifies as a racial minority). Among leadership only two of the four Co-PIs have doctorates in STEM fields recognized by NSF.

B. Symposium:

1. Interviewees recommend that in the future more intentional efforts be made to address the concerns about lack of race/ethnicity diversity among LSAMP leaders, speakers and LSAMP program student receptionists.

2. Lack of full-time Project Director with experience in managing an LSAMP program.

C. Need to develop and implement a strategic plan to enhance the number of STEM tutors and mentors, especially collaborations among research-focused and teaching-focused partners.

D. Need for all partner institutions to be more engaged in attending and actively participating in Alliance meetings, event and volunteering for tasks that benefit the collective.

Recommendations

- There is the need for greater sharing of management responsibilities and coordination among the four Co-PIs.

- To get a better understanding of the status of LSAMP, the PI needs to meet on a regular basis with all four Co-PIs.

- Coordinators should brief their respective presidents on the status of LSAMP on their campus.

- Planning symposium should get feedback from campus coordinator from their own Scholars about recommendations for topics (for speakers and for seminars) and career options and opportunities.

- Co-PIs should be more intentional about developing collaborations between two- and four-year teaching institutions and research institutions.

- Leadership should set deadlines to follow up on actionable items identified at the retreat.

- Leadership needs to convene partners to find out if they will apply for another phase of funding, and if so, who will take the lead.

Conclusion

Although LSAMP has experienced some missteps during the current funding stage, it has made some measurable progress over the 5-year period. While there remains additional room for improvement and, despite some inflating of degree output, there has been a real increase in the

number of historically racial/ethnic minorities who have earned bachelor's in STEM fields. This is important if these two EPSCoR states, characterized by some of the highest rates of poverty and low R&D funding, are to produce workers to compete in an economy driven by innovation, technology and a workforce fueled largely by workers trained in STEM disciplines.

Introduction

This document includes both a formative (2023) and summative report. It is organized around the following sections: (1) Methodology, (2) 2023 Formative Evaluation Findings, (3) Evaluator's Recommendations and the Status of Program Responses 2019-2023, and (4) Conclusions. While there has been some progress (albeit limited and uneven across time), historically underrepresented racial/ethnic minorities HURMs (African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders) continue to be underrepresented at each level of science, technology, engineering, and mathematics (STEM) education and the STEM workforce (Pearson and Fechter, 1994; National Research Council, 2011; National Science Foundation, 2014; Slaughter, Tao, and Pearson, 2015; National Science Foundation, 2020).

Over the last two decades, a plethora of federal and private foundation funding efforts have been implemented to increase the participation of HURMs in STEM disciplines and careers (See BEST, 2004; Committee on Equal Opportunities in Science and Engineering, 2019-2020, Garabino, Fiske, Scherer, and Vargas, 2023; Hrabowski and Henderson, 2019; Leggon, 2020; Leggon and Barabino, 2015; Leggon, 2006; Leggon and Gaines, 2018; Leggon, Romine,

Reidhead, and Chischilly, 2021; National Academies, 2016; National Research Council, 2005, National Center for Science and Engineering Statistics, 2022 and 2023; National Science Board, 2021; National Science Foundation 2011; Pearson and Miller, 2012; Slaughter, Tao, and Pearson, 2015). There is substantial empirical evidence that a high-quality undergraduate research experience and mentoring play significant roles in recruiting and retaining HURMs in STEM disciplines and careers (See Leggon and Pearson, 2009; Chemers et al., 2011; Ghee et. al 2014; Hurtado, et al., 2009; Espinoza, 2011; Leggon, Adams, Wilson, and Younge, 2013; Pearson, 2005; Maton and Hrabowski, 2004; Hrabowski and Pearson, 1993; Hrabowski and Maton, Leggon and Pearson, (1997).

The National Science Foundation's (NSF) Louis Stokes Alliance for Minority Participation (LSAMP) goal is:

> … to assist universities and colleges in diversifying the nation's science, technology, engineering, and mathematics (STEM) workforce by increasing the number of STEM baccalaureate and graduate degrees awarded to populations historically underrepresented in these disciplines: African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders. LSAMP's efforts to increase diversity in STEM are aligned with the goals of the Federal Government's five-year strategic plan for STEM education, *Charting a Course for Success: America's Strategy for STEM Education*. The LSAMP program takes a comprehensive approach to student development and retention. Particular emphasis is placed on transforming undergraduate STEM education through innovative, evidence-based recruitment and retention strategies, and relevant educational experiences in support of racial and ethnic groups historically underrepresented in STEM disciplines…
>
> Overall, the LSAMP program provides funding to alliances that implement comprehensive, evidence-based, innovative, and sustained strategies that ultimately result in the graduation of

> well-prepared, highly qualified students from underrepresented minority groups who pursue graduate studies or careers in STEM. (NSF.gov/lsamp web page).

I. Methodology

This summative evaluation plan called for data collection using a mixed method approach—quantitative and qualitative (Babbie, 2014; Creswell and Creswell, 2022; Leon-Guerrero, Frankfort-Nachmias and Davis, 2020; Kilmer and Cook, 2020; Kennedy, Harnois, Atkinson and Korgen, 2022; Mertens, 2019; Thomas and Campbell, 2020).

From 2019 to 2022, the lead evaluator, in consultation with the then PD, selected three partner institutions of varying Carnegie classifications, geographical location and student demographic composition for case and cross case studies, including site visits in-person, and via Zoom during the COVID-19 restrictions. To maximize participant anonymity and confidentiality, institutions were identified as A, B, and C in reports.

Quantitative data collection was based on e-surveys distributed to students by emails. The surveys included both scaled (usually a 5-point Likert-like scale) and open-ended items. The funding of a LSAMP research study component and its data collection via surveys and interviews resulted in student survey saturation. In 2020, the evaluation team ceased administering the survey as Scholars reported being confused because some of the evaluation

and research survey items seemed similar. Overall, this resulted in unacceptable response rates for statistical analyses.

Qualitative data (except during COVID restrictions) were gathered from report documents, in-person individual (program staff, institution administrators and staff) and focus group (research mentors and Scholars) interview participants. For the Spring 2023 formative evaluation, evaluators conducted individual interviews with a stratified (Carnegie Classification) random sample of seven LSAMP Scholars (78 percent response rate) at the Symposium held on the campus of UK. Zoom interviews were held with the Acting PD, Interim Campus Coordinator, and Co-PIs at UK, and a stratified random (Carnegie Classification) sample of four campus coordinators at five institutions.

The formative component evaluates annual goals and objectives, while the summative components evaluate the effectiveness of the Alliance in meeting its overall goals and objectives for the 5-year funding period ending in 2023. Focused interviews were held with each stakeholder group (e.g., Scholars and research mentors). Individual interviews were conducted with program coordinators, program directors, and senior administrators. Annual interviews were held with the Alliance coordinator, Co-PIs, and the PD. Focus group interviews were analyzed for critical themes aligned with measurable goals and objectives. Evaluators attended the annual symposium and retreats. The formative evaluation plan allows for emergent challenges and opportunities to be identified in a timely fashion to make mid-course corrections. Another qualitative component includes document analysis (e.g., review of minutes, reports, websites, etc.). All data collection involving human subjects was conducted in compliance with the Department of Health and Human Services' (HHS) regulations and the American Sociological

Association's (ASA) Code of Conduct. Specifically, consent forms were administered before participants completed surveys or engaged in interviews. No instruments required personal identifiers. The taped interviews were transcribed by a third-party professional transcriber. Once analyzed, all data (including tapes) were shredded. Before the research study, the annual evaluation reports included a triangulation of interview, document, and survey data analyses. The COVID-19 restrictions significantly altered some data collection. Annual evaluation reports were presented in-person and virtually at the retreats, and hard copies were submitted to the PD for distribution. The next section provides a summary of the 2023 formative evaluation findings.

in LSAMP.

Campus orientation to LSAMP. Roughly half of the Scholars indicated that they did participate in a campus orientation to LSAMP.

Benefits. When asked, "what are the greatest benefits of participating in LSAMP", the most common responses were: (1) "meeting other STEM minorities", and (2) "sense of community."

Other comments are highlighted below:

· "The stipends help a lot. And that's what a lot of people say when they join. Also, just the fact that as undergraduate students who want to be accepted to Graduate School, we are getting the stuff checked off our list that we need—like community service and research opportunities."

· "Just these past two days at the Symposium being around other minority students who are in STEM, I feel a lot more motivated now since I'm with other people who look like me. Everyone is just so welcoming."

· "The best part is connecting with other LSAMP students and getting to know other people who have the same missions and goals."

· "Meeting other minorities personally. I have a lot of struggles that other minorities can relate to. Meeting with LSAMP students and saying, 'I've gone through this…oh, you were going through this too.' That's nice."

· "There are so many things I didn't know before I was in LSAMP. I didn't really know if it was real until I got the e-mail and asking me if I wanted to join, and what was required if I did join. It sounded interesting. It was an honor to be chosen because of my grades and interest in science and mathematics. I started attending the meetings and reading all the e-mails. I just started seeing so many opportunities that I didn't see before. So many opportunities to get scholarships to enhance my interest in science or math. The most beautiful thing is that I got to expand my view of college."

It is noteworthy that a substantial majority (*71%)* of the Scholars indicated that they *could not think of anything that was the "least helpful" about the program,* as one Scholar said: "It's all to help us get ahead." Another said, "If you are interested in research, it's for you."

Research Experience. When asked to use a scale of 1 to 5 (1=not at all; 5=a great deal) to respond to the following question. "Have you participated in research while in LSAMP?" The majority said that they had not had any research experience. This was largely because most had been in the program less than one full year. Some comments are instructive:

· "I'm an older student. It would have been great to have found a community like this when I first graduated high school. Now, there are few opportunities that I can take with my work

schedule. I would love to do some research that is biology-related, but I haven't gotten a chance to at this point."

- "In my first year, I presented one research project. I've been wanting to do another so badly the last few years, but I haven't had the time. But I am doing a research project in the summer."
- "I would definitely love to do anything research related."
- "Just to participate, to see how I feel about research in that field. It's like a job shadowing type of thing."
- "I started last summer, and it's been ongoing."
- "I am going to try again this summer and hopefully find a research opportunity."

Using a 5-point scale (1=not at all; 5= a great deal], Scholars were asked, "To what extent has the LSAMP Program enhanced your confidence to do research?" The average rating was 4.3. These comments are relevant:

- "It has enhanced it a lot, especially in the last semester. I was kind of in the dark about research. I didn't know where to get started. Being in this program and around students who are also trying to get a foot into science research, has contributed to me having a better understanding."
- "It has enhanced my confidence because I learn about various research options. The program provides a space for us to talk about different conventions."

LSAMP Support. One of LSAMP's key components is providing academic support for LSAMP scholars. When asked "how satisfied are you with the academic support from LSAMP", the average rating was "3.75". One Scholar briefly expressed their satisfaction with LSAMP's academic support as follows: "A lot, especially when I changed my major." Another was more

expansive: “They ask at the start of each semester if I need anything with my required books or anything that I might need. I did get a calculator this semester. They've always asked me if I needed anything else. They've also shared links on how to get tutors or information on tutors or where to find them. During the semester meetings, I get asked how am I doing in my classes? I feel comfortable with them if I need some help.”

Scholars’ average rating on a scale of 1 to 5 (1=not at all satisfied; 5=very satisfied) for their satisfaction with LSAMP’s career advice was 3.71 “How satisfied are you with the STEM-related career advice you have received from LSAMP?” The responses were mixed.

Some were satisfied:

· “I’m very satisfied, I really think they’ve helped us. I’ve already been in research for a while, but for first-year students who were starting, there were a lot of good resources for them to be able to talk about starting and going into research and how they can continue to graduate school.”

· “I would ask questions and they would point me to a better set of resources.”

· “I have been satisfied. (Campus Coordinator) responds to e-mails fast. I have been thankful for the advice I've been given.”

Others were not:

· “None directly through LSAMP.”

· “I just don't get a lot from the higher ups. A lot of the things I find out through other LSAMP students.”

Post-secondary Plans. Of the two Scholars who reported that they were planning to pursue post-secondary professional studies, both specified medicine. Another said that they thought that

the purpose of LSAMP was to "enhance their application to medical school." Although this has been a perennial problem, of course, it is not the focus of the National Science Foundation.

On a scale of 1 to 5 (1= not at all likely; 5=very likely), Scholars were asked "What is the likelihood of you applying to Graduate School?" The average rating was 3.9. Some Scholars put their ratings in context:

- "I am currently looking at a biomedical and bioinformatics master's degree. And then possibly going into a PhD later. I haven't decided."
- "I want to study biotechnology."
- "I would like to get a PhD, but I know it's a lot of money."

Evaluations of LSAMP campus program staff. Only one Scholar confirmed completing an evaluation of their campus LSAMP staff. This is consistent with previous external evaluation findings. However, at this Scholar's site, the coordinator routinely requests anonymous feedback on ways to improve the program's delivery of services. Other sites could benefit by employing this practice.

LSAMP Scholar meetings. When asked "Do LSAMP students meet periodically," Scholars replied that they do meet, although the periodicity varies:

- "We have meetings Mondays and Thursdays."
- "We have meetings every two weeks."

· "…we usually meet on Wednesday at 5:00 o'clock PM. We are required to attend at least four events each semester to reach a certain stipend…Not everyone can "l ways make it. I think it would be helpful if we could switch the times and things."

· "Most of the regularly scheduled meetings are on reaching out to professors to secure research opportunities, managing stress and study skills—mostly like essential things we would need for advanced science classes."

When asked: "Would you like to have input into the agenda for the meetings?" Scholars responded:

· "I think it would be helpful because there are a lot of students who are from different years—like first-year students, sophomores, seniors. I think it could cater towards their specific needs."

· One Scholar noted that in addition to the regularly scheduled meetings "We were talking about meeting outside of our regular meeting time so we can get to know each other more on a personal level—going out to eat, bowling or skating."

Scholars were asked about their participation in scientific meetings: "Have you attended a scientific conference? Virtual or otherwise". A majority had. In fact, one said that they were presenting at the LSAMP Symposium.

Symposium

· More than half of the Scholars mentioned the lack of diversity among speakers (no scientists or males), and no real focus on careers in STEM other than academic engineering.

· as timely communication and transparency around the Project Director or coordinator's departure troubling. They reported being stunned to hear from someone with whom they were unfamiliar regarding the status of the LSAMP program. The individual turned out to be the acting Project Director or Project Coordinator. Later, the coordinators would also learn that there was a new Co-PI who was approved by NSF—an education administrator and professor (PhD in Education) and not a PhD in a STEM field (including social, behavioral, and economic sciences) as the retiring Co-PI (PhD Chemist). There was concern that there was no input in the reorganization of the lead institution (UK) LSAMP office. Out of courtesy, the coordinators felt that they should have been contacted and to see if any of them would be interested, as some of them had experience with LSAMP programs.

> The PI had been misled. After the resignation, ethical, legal, and IRB problems were revealed. To redress the situation, the PI immediately met with their senior reports to identify a team to review the situation and develop a plan of action. Because this was a personnel matter, the PI was limited in what information could be released to the Alliance partners. Coordinators want to be part of the discussions about restructuring the Alliance—including staff. Ultimately, the PI has authority to remove or appoint grant personnel. They have been far more hands on in rebuilding the lead LSAMP institution and outreach to other university presidents. Unfortunately, the lack of communication remains problematic.

Rotation of the Symposium. In 2021, the Symposium was held at Kentucky State University an HBCU. By accounts, the symposium was a success. Nevertheless, the following year the Symposium returned to UK, the lead institution. According to the former Project Director

Coordinator, the return was needed so that institutional representatives could draft a policy document to provide criteria for selecting symposia sites. The evaluators are not aware of what happened with this. In addition to rotating sites, interviewees emphasize the need for institutional partners to have greater input in planning the Symposium and selecting the speakers/topics more in line with their Scholars' interests. There was consensus among Scholars that the highlight of the Symposium was interacting with other Scholars. However, Scholars strongly recommend that the next symposium should make every effort to recruit more student receptionists, Alliance leaders, speakers, and other symposium participants who "look more like them" and better represent STEM disciplinary diversity. At the time of this report, the acting Project Director e-mailed the partners requesting input into the planning of and hosting the 2024 Symposium. Co-PIs report that no partner institutions has volunteered.

According to the PIs, there is a listserv where partners can post relevant activities, ideas and seek assistance but the link has seldom been utilized. This begs the questions as to why. The previous project director regularly conducted in-person site visits—except during Covid when they were virtual. It was reported to the evaluator that more site visits would be conducted: however, at this writing it is not clear who will do the site visits, how many site visits and when they will be done. Co-PIs need to be more proactive in sharing best practices and facilitating scholarly research opportunities between research and primarily teaching institutions. The new team has been more proactive in engaging interaction between the lead institution and partners. There is concern that there is too much focus on teaching students how to study in general; this is usually met by Student Affairs. There needs to be more focus on best practices to recruit more STEM faculty as tutors for Scholars in upper division STEM courses.

The main themes in the non-Scholars' interviews were: LSAMP and institutional structural changes; timely communication; adjustments for two-year institutions; interaction between and among Alliance partners; the Symposium; recruiting STEM mentors and STEM tutors; lack of rigorous STEM focus.

Disadvantages.

owing how many hours, you should take or should not take in STEM courses is another thing.

over, interviewees recommend that the LSAMP leadership be more proactive in facilitating interactions on sharing best practices and fostering peer mentoring relationships between more recent campus coordinators and more senior coordinators.

e: Completed

Recommendation:

Dedicate a session or workshop involving campus coordinators on strategies to facilitate more research opportunities for Scholars attending predominantly teaching institutions. This