

Final Report

2013/14 to 2017/18

Kentucky-West Virginia
Louis Stokes Alliance for
Minority Participation
(KY-WV LSAMP)



Submitted to
The National Science Foundation
2415 Eisenhower Avenue
Alexandria, VA 22314





Annual Research Symposium 2019



Dr. R. Paula Arscott-Hopson - 2018 Symposium Keynote



LSMCE Conference



LSU iREU France 2017



LSU iREU Puerto Rico 2017



NCUR 2019



Tracy Drain Visit to UK



Women of Color STEM Conference



WV Res Day @ the Capitol

Kentucky-West Virginia Louis Stokes Alliance for Minority Participation

2019 Final Report

Kentucky – West Virginia
Louis Stokes Alliance for Minority Participation
In Science, Technology, Engineering, and Mathematics
(KY-WV LSAMP STEM)

Submitted by

University of Kentucky
Lead Institution

Eli Capilouto, DMD, Sc.D.
Principal Investigator

Kazi Javed, Ph.D.
Orlando McMeans, Ph.D.
David Miller, Ph.D.
Johné Parker, Ph.D.
Co- Principal Investigators

Fara Williams
Project Director

TABLE OF CONTENTS

| Section | Page |
|--|------|
| Project Personnel | 1 |
| Introduction..... | 2 |
| Projected Outcomes | 3 |
| Projected Outcome One..... | 3 |
| Projected Outcome Two..... | 5 |
| Additional Important Outcomes | 6 |
| Graduate School..... | 6 |
| Add Partner Institution..... | 6 |
| International Experiences..... | 6 |
| Annual Research Symposium..... | 7 |
| Retreat Goals..... | 8 |
| Number of Participants | 8 |
| Documented Scholar Presentations..... | 9 |
| Speaker Series..... | 10 |
| Program Activities | 11 |
| External Evaluation | 11 |
| Program Staff Roles | 13 |
| Project Director..... | 13 |
| Financial Officer | 14 |
| Campus Coordinators..... | 14 |
| Governing Board | 14 |
| External Advisory Board..... | 14 |
| External Partnerships and Funding..... | 15 |
| Links to Existing Campus Programs and Campus Honors | 17 |
| Cyber-Sharing | 21 |
| Dissemination..... | 22 |
| Proposal for Continued Funding | 22 |
| Faculty and Staff Highlights and Professional Development..... | 23 |
| Scholar and Alumni Highlights | 23 |
| Conferences and Symposia | 23 |
| National Conference on Undergraduate Research..... | 24 |
| Women of Color STEM and Black Engineer of the Year Award Conferences | 24 |
| Highlighted Individual Accomplishments | 26 |
| Resources | 29 |

| | |
|---|----|
| Appendixes | 30 |
| Appendix A – International Research Travel Checklist..... | 31 |
| Appendix B – KY-WV LSAMP Program Evaluation | 35 |
| Appendix C – Comic Representation of WVU Publication..... | 44 |

LIST OF TABLES

| Table | Page |
|--|-------------|
| 1. Number of Symposium Attendees | 7 |
| 2. Number of 2018-19 Scholar Presentations by Institution and Type | 10 |
| 3. Comparison of Presentations by Academic Year | 10 |
| 4. Members of the External Advisory Board | 15 |
| 5. NCUR Attendees by Year and Institution | 24 |
| 6. WOC Attendees by Year and Institution | 25 |
| 7. BEYA Attendees by Year and Institution..... | 25 |

LIST OF FIGURES

| Figure | Page |
|--|-------------|
| 1. URM STEM Bachelor Degrees Granted at KY-WV LSAMP Institutions | 3 |
| 2. URM STEM Bachelor Degrees Granted by Ethnicity..... | 3 |
| 3. URM STEM Enrollments at KY-WV LSAMP Institutions | 5 |
| 4. URM STEM Enrollments by Ethnicity..... | 6 |
| 5. Number of KY-WV LSAMP Participants by Year | 8 |
| 6. Graphic Representation of the KY-WV LSAMP Ripple Effect..... | 9 |

PROJECT PERSONNEL

The Kentucky-West Virginia Louis Stokes Alliance is comprised of the following key personnel:

Eli Capilouto, DMD, ScD elic@uky.edu
Principal Investigator
University of Kentucky
101 Main Building
Lexington, KY 40506-0032

Maurice Cooley cooley@marshall.edu
Campus Coordinator
Marshall University
Old Main, 107; One John Marshall Drive
Huntington, WV 25755-1055

Kazi Javed, Ph.D. kazi.javed@kysu.edu
Co-Principal Investigator
Kentucky State University
130 Carver Hall, 400 East Main Street
Frankfort, KY 40601

V. Faye Jones, MD, Ph.D., MSPH vfjone01@louisville.edu
Campus Coordinator
University of Louisville
323 East Chestnut Street
Louisville, KY 40202

Orlando McMeans, Ph.D. mcmeanso@wvstateu.edu
Co-Principal Investigator
West Virginia State University
1003 Curtis Complex; PO Box 1000
Institute, WV 25112

Hannah Payne hannah.payne@wvstateu.edu
Campus Coordinator
West Virginia State University
2100 Toney House
Institute, WV 25112

David Miller, Ph.D. millerd@math.wvu.edu
Co-Principal Investigator
West Virginia University
PO Box 6310
Morgantown, WV 26508-6310

Charles McGruder, Ph.D. mcgruder@wku.edu
Campus Coordinator
Western Kentucky University
TCCW 220; 1906 College Heights Blvd #11077
Bowling Green, KY 42101-1077

Johné Parker, Ph.D. johne.parker@uky.edu
Co-Principal Investigator
University of Kentucky
175 Ralph G Anderson Bldg.
Lexington, KY 40506-0503

Raúl Torres raul.torres@uky.edu
Campus Coordinator
University of Kentucky
103A Frazee Hall
Lexington, KY 40506

Willie Pearson, Ph.D. kingvassie@comcast.net
Program Evaluator
Georgia Institute of Technology
119 Old C.E.
Atlanta, GA 30318

Charlene Walker charlene.walker@kctcs.edu
Campus Coordinator
Bluegrass Community and Technical College
470 Cooper Drive, 206E Oswald Building
Lexington, KY 40506-0235

Fara Williams fara.williams@uky.edu
Project Director
University of Kentucky
1519 Patterson Office Tower
Lexington, KY

John Wilson, Ph.D. john.wilson@centre.edu
Campus Coordinator
Centre College
600 West Walnut Street
Danville, KY 40422

INTRODUCTION

The Kentucky-West Virginia Midlevel Louis Stokes Alliance for Minority Participation program (KY-WV LSAMP) was a nine-institution alliance led by the University of Kentucky. Alliance members include: Bluegrass Community and Technical College (BCTC), Centre College, 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). KY-WV LSAMP is now a Pathways and Research Alliance of ten institutions. With approval for a third phase of funding, Jefferson Community and Technical College was added to the alliance. 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. This report is a compilation of summative accomplishments for the five-year funding period as a Midlevel Alliance.

For the second cycle of funding, the alliance projected the following key outcomes: increase URM STEM BS degrees at alliance institutions by 50% for a total of at least 1,000 BS STEM degrees over five years. This was to be accomplished by achieving increases in total alliance enrollments to at least 2,000 average annually (a 25% increase) with similar increases in retention, transfer rate, and graduation rates. These increases also contributed to increases in application to and attendance in STEM graduate degree programs.

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 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 the leaders and experts. Scholars give and receive mentoring on multiple levels from middle school and high school students to 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 Program 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 and industry. 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 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.

The mission statement and logo adopted in 2016 continue to be used. The logo is easily recognized and is expected to be used by program staff and Scholars throughout the alliance on presentations, including, but not limited to posters and papers. The logo is helping to unify the alliance into a group working together for a common purpose.

There have been many successes as well as some continued challenges and trials. Progress continues to be made to increase the quantity of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics disciplines. There also continues to be significant progress in the skill set and professionalism of the participants as they progress in their professions.

PROGRAM OUTCOMES

The Kentucky-West Virginia Louis Stokes Midlevel Alliance for Minority Participation consisted of nine colleges and universities. Of these, there are comprehensive research universities, two historically black college and universities (HBCU), regional universities, and a 2-year college. Using knowledge learned from past successes paired with lessons learned from past shortcomings, the alliance has increased the number of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics disciplines. To accomplish this goal, the following objectives were proposed and have been met.

Projected Outcome One

To increase URM STEM BS degrees from 168 annual average to 250 annually for a total of 1,000 degrees over 5 years

This goal was met. In the five years of funding (2013-2018), a total of 1,552 URM STEM bachelor degrees were granted by KY-WV LSAMP institutions. In 2018, 375 URM STEM bachelor degrees were granted. This is a 4% increase from the previous year, a 123% increase from the 168 average used in the proposal, and a 140% increase from the baseline year (173 degrees in 2006-07). Year by year numbers are in the figures below. Some data for years 2011-2014 (that was previously missing) was acquired from the Kentucky Council on Postsecondary Education and the West Virginia Higher Education Policy Commission. The rest of the data was provided to and recalled from WebAMP. Figure 1 shows the number of degrees from 2006-07 to 2017-18. Overall, there have been 2,799 URM STEM bachelor's degrees granted at KY-WV LSAMP institutions since 2006. In addition, when exploring degrees by ethnicity, it is

clear there has been a significant increase in degrees granted to African Americans, Hispanics, and students of more than one race. Figure 2 shows the breakdown of URM STEM bachelor's degrees granted by KY-WV LSAMP institutions by ethnicity.

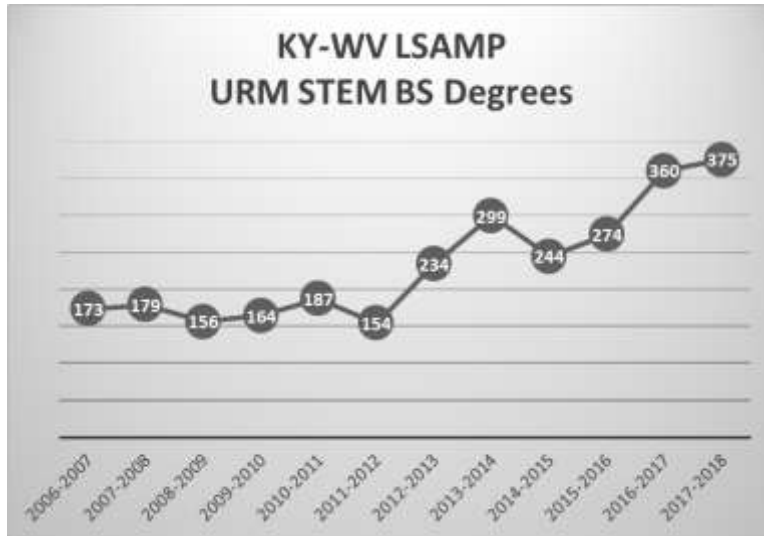


Figure 1: URM STEM Bachelor Degrees Granted at KY-WV LSAMP Institutions

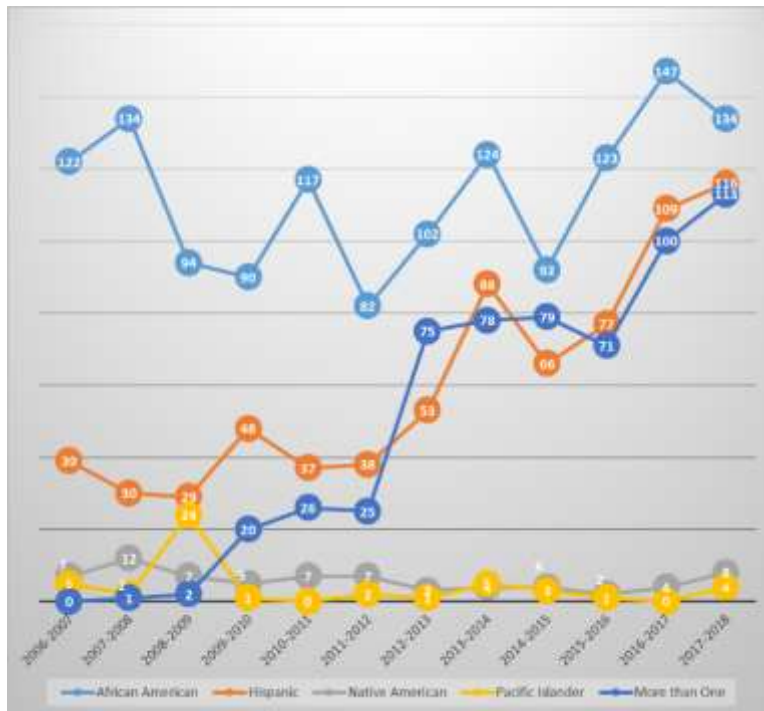


Figure 2: URM STEM Bachelor Degrees Granted by Ethnicity

Projected Outcome Two

To increase URM STEM enrollments from 1599 to 2000 annual average

This goal has been met. Traditionally, underrepresented (URM) populations targeted by the national LSAMP program (African American, Hispanic, Native American, and Pacific Islanders) represent an almost unique recruiting challenge for the KY-WV LSAMP institutions because of their unusually low percentages of the populations of the two states. Even though the URM population accounted for over 26% of the US population, they comprise only 16% and 6%¹ of the population in Kentucky and West Virginia, respectively. This continues to be a challenge to recruiting students.

Even with this challenge, the KY-WV LSAMP has been successful in increasing enrollments. In 2017-18, there were 2,743 URM students enrolled in STEM bachelor degree programs at KY-WV LSAMP institutions. This is a 4% increase from the previous year and a 43% increase from 2006/07. This also brings the average annual enrollment for the funding period to 2,394 - meeting the goal of 2000 per year. Figure 3 shows the number of URM STEM enrollments at KY-WV LSAMP institutions since 2006. Again, there has been a significant increase in the number of African Americans, Hispanics, and students of more than one race who enrolled in STEM programs at KY-WV LSAMP institutions. Figure 4 shows the breakdown of URM STEM enrollments by ethnicity.

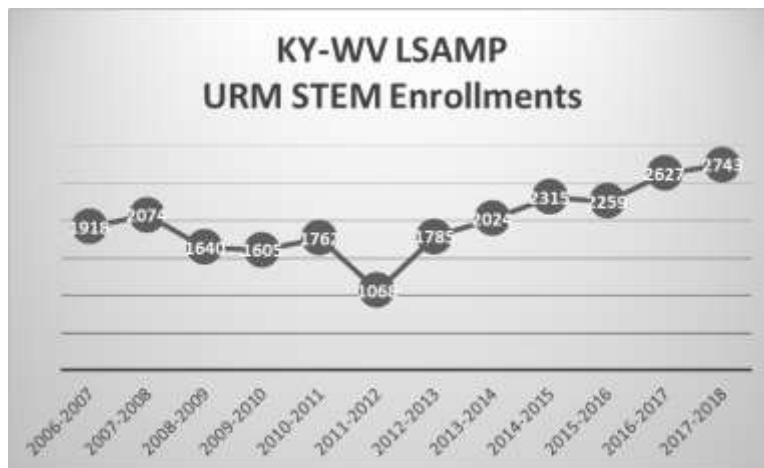


Figure 3: URM STEM Enrollments at KY-WV LSAMP Institutions

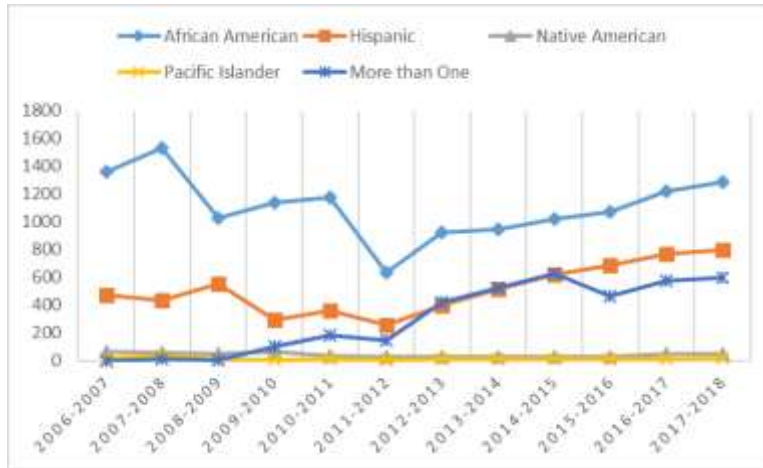


Figure 4: URM STEM Enrollments by Ethnicity

Additional Important Outcomes

Other goals were set and reached. Examples of other accomplishments for the funding period included:

Increase URM STEM application to and attendance in graduate degree programs from 10 students per year to 30 per year (by year 5 of the program). In 2018-19, there were 42 KY-WV LSAMP participants who graduated with STEM bachelor degrees. Of those, 24 (57%) are pursuing graduate and/or professional degrees. Though this did not meet the goal of 30, it does represent over half of the participating graduates.

Add partner(s), specifically community colleges. Jefferson Community and Technical College is now a member of the alliance beginning with year 1 of the third funding cycle (2018-19).

International Experiences. Summer 2017, **I. Khalil Appleton**, UK, participated in a study abroad in Japan. Two Scholars conducted international research courtesy of the LSU iREU program. **Danielle Chavis**, WKU, conducted research in Puerto Rico. **Sarah Hodges**, UK, conducted research in Grenoble, France. Through her experience in planning her travel, Sarah developed a checklist for international research travel. This document will help countless future Scholars in planning for and taking advantage of international experiences. A copy of the checklist can be found in Appendix A. Sarah was chosen to serve as a student leader for the LSU iREU summer 2018 and her checklist has already been utilized and updated several times.

In summer 2018, more KY-WV LSAMP Scholars had international experiences. **Asare Nkansah**, UK, was selected for the France iREU program and conducted research in Bordeaux. Three Scholars (**Ky'Achia Atkins**, WVSU; **Lloyd Bartley**, UofL; and **Taylor Fisher**, UofL) presented at the LSU iREU in-France workshop held June 28-30, 2018, in Toulouse. **Edwina Barnett**, WVSU, participated in the Organization

for Tropical Studies REU in Costa Rica. **Mohanad Abdallah**, UK, conducted research in Germany through a Research Internship in Science and Engineering from the German Academic Exchange Service.

Four other Scholars participated in study abroad experiences including three that were for multiple semesters. **Sajana Dumre** studied in Spain Summer 2018. **Scott Lopez**, WVU, studied and conducted research in Japan for one year with support from the Boren Scholarship. **Karen Udoh**, UofL, studied abroad in Greece through a Fulbright Scholarship. **Je’Coiya Moore**, Centre, studied and conducted research in China.

In summer 2019, five Scholars participated in international research experiences such as REU programs. **Lloyd Bartley**, UofL, conducted research in Toulouse, France, through the LSU iREU. **Noela Botaka**, received a Fulbright Research Award and traveled to Belgium. **Charles “Carlos” Beasley**, **Victor Holness**, and **Darian Parker**, from UK, conducted research in Dijon, France, with the UK Broadening Participation in Engineering (BPE) Program. The Dijon experiences were as a direct result of collaborations a KY-WV LSAMP research mentor (Dr. Eduardo Santillan-Jimenez) built because of his LSAMP mentee’s participation in the France REU in Summer 2017. That year, in addition to the support provided to Sarah Hodges, the iREU selected Dr. Santillan-Jimenez for a \$5,000 faculty award to build collaborations and provide support for conference travel. That investment culminated with Carlos, Victor, and Darian traveling to France for the summer two years later.

Annual Research Symposium. Participation in the KY-WV LSAMP Annual Research Symposium increased significantly over the course of the funding period. Table 1 shows a comparison of the 2016, 2017, 2018, and 2019 symposium attendees. In 2017, the event expanded from a one-day to a two-day event. Day one is intended as professional development for LSAMP participants and includes opportunities for community building and personal networking. Day two is intended as an opportunity to showcase research conducted by LSAMP participants and provide professional networking. There are links to the program books on the program website.

Table 1: Number of Symposium Attendees

| | Faculty | Staff | Graduate Students | Undergrad Students | K-12 Students | Other | TOTAL |
|----------------------|----------------|--------------|--------------------------|---------------------------|----------------------|--------------|--------------|
| 2016 Saturday | 15 | 11 | 1 | 27 | 0 | 5 | 59 |
| 2017 Friday | 8 | 9 | 4 | 43 | 0 | 2 | 66 |
| 2017 Saturday | 17 | 14 | 8 | 50 | 0 | 4 | 93 |
| 2018 Friday | 10 | 9 | 3 | 74 | 0 | 1 | 97 |
| 2018 Saturday | 13 | 9 | 2 | 84 | 2 | 2 | 112 |
| 2019 Friday | 14 | 14 | 5 | 93 | 1 | 2 | 129 |
| 2019 Saturday | 18 | 17 | 3 | 94 | 43 | 4 | 179 |

Retreat Goals. Beginning 2016, the project director began planning and implementing annual alliance retreats. Each summer, program administrators and staff gather for a 1 ½ days meeting to discuss program accomplishments and issues. During the retreat, goals for the upcoming academic year are discussed and set. Goals include increasing the number of participants, the number of documented Scholar presentations, the percentage of Scholars conducting academic year research, and the number of documented summer research internships.

Number of Participants. There was a significant increase in the number of participants during the course of the funding period. The funding period began with 147 participants. In 2018-19, there were 281 participants. This is a 91% increase. The number of participants is shown in Figure 5.

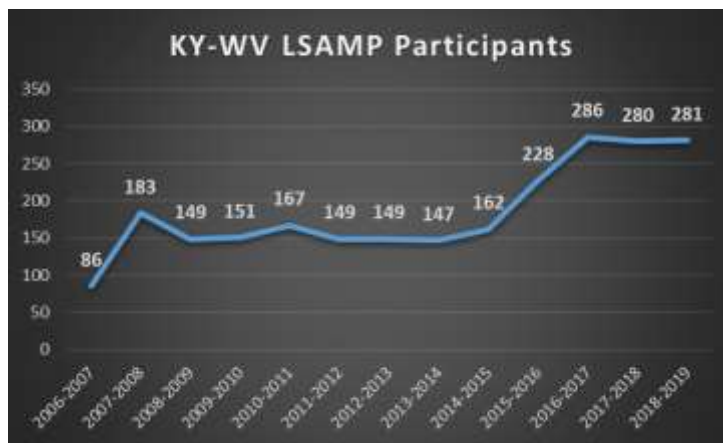


Figure 5: KY-WV LSAMP Participants by Year

In order to continue meeting program goals of increasing URM STEM enrollments and degrees, KY-WV LSAMP must strive to increase the number of students who participate in program activities and receive program benefits. The increase in program participants (Scholars) should result in a ripple effect that increases the number of students earning STEM degrees not only at the partner institutions, but throughout the entire region including all of West Virginia and Kentucky. This is demonstrated in Figure 6 which was created in 2016. Directly Funded Scholars receive direct LSAMP financial support (such as stipends, tuition aid, textbooks, conference travel, etc.) and participate in program activities. Unfunded Scholars do not receive direct LSAMP financial support but are documented as being accepted into the program and participating in program activities. Non-Scholar Participants have not been formally accepted into the program but participate in one or more program activities (such as attending Scholar Meetings or research symposia). Influenced Students have no direct connection or communication with program staff or participation in program activities but may be influenced and/or mentored by friends and/or family who do. The ending result is an increase in URM, STEM, and undergraduate research programs and participants throughout the alliance and the region.

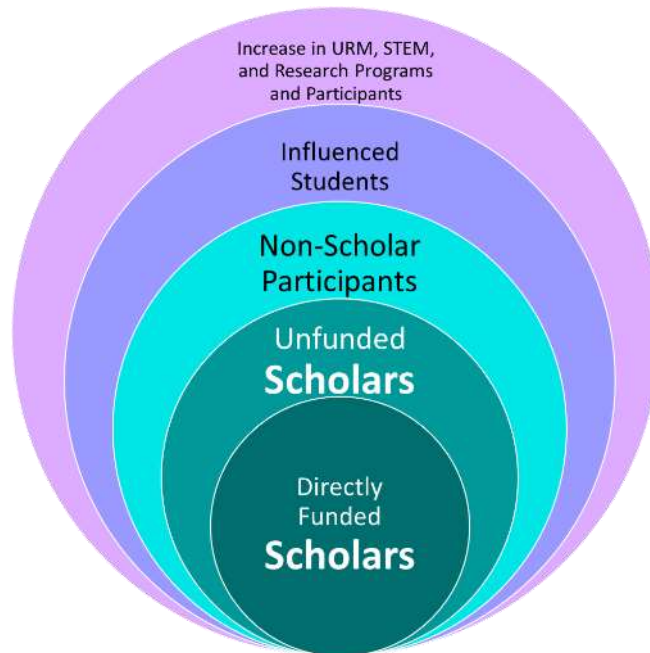


Figure 6: Graphic Representation of the KY-WV LSAMP Ripple Effect

Documented Scholar Presentations. Giving presentations, especially research presentations, is a skill that can and should be developed for today’s STEM professionals. For that reason, KY-WV LSAMP encourages (and in some cases, requires) and supports Scholar presentations at local, state, and national conferences and symposia. In 2018-19, KY-WV LSAMP made 114 presentations – meeting the goal of 100 per year. These conferences included, but were not limited to: the Louisiana State University (LSU) international Research Experience for Undergraduates (iREU) Workshop in France, the Kentucky Academy of Sciences Annual Meeting, West Virginia Research Day at the Capitol, the KY-WV LSAMP Annual Research Symposium, the National Conference on Undergraduate Research, and the American Chemical Society National Meeting. Table 2 shows the breakdown of presentations by institution and type. Table 3 shows a comparison of presentations by academic year. It is clear to see the number of presentations is rising. In addition, though there are not presentation opportunities at the Women of Color STEM Conference nor the Black Engineer of the Year Award (BEYA) Conference, they are excellent professional development opportunities. The number of Scholars attending these events continues to rise with 57 attending in 2018-19. Furthermore, two UK Scholars attended the Alltech One19 Ideas Conference. This was an international event held in Lexington, KY, May 19-21, 2019.

Table 2: Number of 2018-19 Scholar Presentations by Type and Institution

| | Local | State/Regional | National | International | TOTAL |
|-----------------|-----------|----------------|-----------|---------------|--------------|
| BCTC | 0 | 0 | 0 | 0 | 0 |
| Centre | 11 | 3 | 0 | 0 | 14 |
| KSU | 4 | 5 | 2 | 0 | 11 |
| Marshall | 1 | 6 | 0 | 0 | 7 |
| UK | 3 | 13 | 6 | 2 | 24 |
| UofL | 0 | 5 | 0 | 0 | 5 |
| WVSU | 5 | 10 | 0 | 1 | 16 |
| WVU | 11 | 12 | 4 | 0 | 27 |
| WKU | 0 | 7 | 3 | 0 | 10 |
| TOTAL | 35 | 61 | 15 | 3 | 114 |

Table 3: Comparison of Presentations by Academic Year

| BY TYPE | 2015-16 | 2016-17 | 2017-18 | 2018-19 | TOTAL |
|----------------------------|-----------|-----------|-----------|------------|------------|
| Local | 8 | 11 | 20 | 35 | 74 |
| State/Regional | 32 | 26 | 29 | 61 | 148 |
| National | 11 | 10 | 20 | 15 | 56 |
| International | 0 | 2 | 6 | 3 | 11 |
| TOTAL Presentations | 51 | 49 | 75 | 114 | 289 |
| Non-Present Nat'l | Unknown | 13 | 31 | 59 | 103 |

Speaker Series. In April 2017, Dr. Tracy Drain (a UK alumna) and Dr. Danielle Nuding from the Jet Propulsion Lab (JPL) gave a series of presentations in Lexington for the KY-WV LSAMP Speaker Series. Spearheaded by Dr. Johné Parker (KY-WV LSAMP Co-PI and one of Tracy Drain’s professors when she was a student at UK), the UK LSAMP partnered with Kentucky EPSCoR and the UK Office of Institutional Diversity in order to bring Dr. Drain and her colleague Dr. Nuding to campus. There were a series of sessions at UK and in the Lexington community at which they spoke about their career paths and experiences.

PROGRAM ACTIVITIES

External Evaluation

Each year for the last three years, the evaluation team has visited three of the nine institutions in order to perform focus groups and interviews with Scholars, faculty mentors, program staff, and campus administration. An electronic survey is distributed to all Scholars throughout the alliance. Interviews are also held with the Project Director and other program staff at the lead institution. Using data collected through these methods as well as data provided by the Project Director, the evaluation team creates an analysis of the success of the LSAMP program as an alliance. They offer recommendations to improve the program as a whole as well as give quality feedback to the site visit campuses.

Dr. Willie Pearson, Jr. was contracted to serve as the external evaluator of the KY-WV LSAMP program. Ed Marshall assists Dr. Pearson in evaluating the program. In June 2015, nine recommendations were suggested by the evaluators. Of those, all have been addressed and/or continue to be addressed. Program aspects that require continuous adaptations and improvement include: data gathering and maintaining processes, dissemination of best practices, website updates, and inter-alliance communications. In June 2016, nine more recommendations were made. Of those, seven have been and continue to be addressed. Two are in progress and will continue to be evaluated and revised as needed – documenting program participation and adjusting program activities and services to meet the needs of all participants. In June 2017, 16 recommendations were made by category – four for students, three for program staff, two for program administrators, and seven for the external evaluation. Of these, most have been addressed or have had substantial progress. In June 2018, 14 recommendations were made by category – research, recruitment, transition from college to graduate school, community building, and data management. Some of the progress on those recommendations include, but are not limited to:

- **Research:** There has been an increase in scholar participation in summer programs such as REU's. Students who have participated in summer programs in the past are being asked to share their experiences with other scholars in order to increase application and acceptance to those opportunities. One campus (a traditionally teaching institution) received a grant from the USDA to begin a summer research program. One of the goals of the next funding period is to help campuses with little research opportunity to create or expand academic year research opportunities at neighboring major research institutions.
- **Recruitment:** On some campuses, scholars are encouraged to aid in recruitment by "bringing friends" to program activities. On some campuses, the LSAMP program has a direct connection with diversity offices. The program staff will work to expand these on **all** campuses.
- **Transition from college to graduate school:** Graduate school will be the main topic of the Friday sessions of the 2020 symposium. The program is also expanding efforts to increase the number of graduate schools and departments to host recruitment tables at the symposium each year. Scholars are invited to attend events such as a GEM Grad Lab in Knoxville, TN, September 2019. It is also hoped that UK and possibly other institutions in the alliance will host a GEM Grad Lab during the new funding cycle. During the new cycle, KY-WV LSAMP will also be submitting proposals to host cohorts of Bridge to the Doctorate (BD) fellows.
- **Community building:** Effort is being put into creating a better sense of community. The UK Office of Institutional Diversity has purchased lapel pins and will be purchasing t-shirts for program

participants and staff. Social media accounts were created, and a group of participants is in the process of being created to lead the social media efforts of the program. Campuses and the alliance as a whole are working to create and/or expand scholar activities and connections during the academic year.

- Data management: The collection and maintenance process for participant data continues to be adjusted in order to maximize accuracy, completeness, and effectiveness while minimizing confusion, time, and effort.

Using data and information received during the funding period, a summative evaluation of the Mid-level alliance was created. A copy of the complete evaluation is in Appendix B. The executive summary is:

Phase II of the KY-WV Louis Stokes Alliance for Minority Participation (LSAMP) Program, funded by the National Science Foundation, aims to build on achievements of Phase I of the grant—i.e., further enhancing the participation of underrepresented racial minority (URM) populations in science, technology, engineering and mathematics (STEM)-related academic majors and careers. Among the goals of Phase II were to address some of the challenges associated with Phase I, including increasing the quality and quantity of students from URMs receiving baccalaureate degrees in STEM fields and increasing the number of URMs attending graduate school or entering the STEM workforce upon receipt of a STEM degree (KY-WV LSAMP Phase II Proposal).

A gap associated with the funding between Phase I and Phase II of the grant led to disruptions in program management at some institutions, including the lack of a Project Director (PD) at the lead institution. However, based on recommendations from external evaluators, a PD was hired in 2015. This has resulted in operational changes that were immediately apparent to and embraced by Alliance partners, including enhanced communication and streamlined data management. Nevertheless, substantial and measurable progress has been made with the enhancement of the Alliance website, allowing general information, forms and documents to be readily accessed.

During the last three years of Phase II, some 211 Scholars completed e-surveys and 60 participated in focus group interviews. In terms of demographics, 65 percent of the respondents self-identified as female and 70 percent self-identified as Black or African American. Of the 39 who self-identified by race and ethnicity (i.e., Hispanic), 41 percent self-identified as White. A substantial majority (86 percent) of Scholars majored in the life/biological sciences; followed by engineering (21 percent). Both majors, however, were highly gendered with females comprising 81 percent of the life/biological sciences majors, while males accounted for 60 percent of those majoring in engineering.

Additionally, focus groups were held with approximately 60 Scholars and 22 research mentors. In-person interviews were conducted with five department chairs, nine institutional program staff, seven senior administrators (e.g., provosts, deans, and vice presidents) and five university staff who provided support services to their program. Each year, in-person interviews were conducted with the Program Director. In-person interviews were conducted with Co-PIs when the evaluators conducted site visits at their institution. During the annual symposium, informal interviews were conducted with students.

For the purpose of this summative evaluation report, it is critical to contextualize the status of the Alliance. When the current external evaluator was contracted in 2015, no external evaluation had been conducted for

the first two years of Phase II. While some success occurred during Phase 1, most institutional representatives and faculty research mentors described Phase I as largely *chaotic* and *dysfunctional*.

Although Phase II sought to build on some of the successes of Phase 1, the primary focus was on remediating the significant challenges that obstructed the functioning of the program as a comprehensive, integrated “alliance.” The most critical observation made by the external evaluation team was the need for a full-time, dedicated PD. The absence of this person was at the core of many of the challenges confronting the Alliance. It was essential to secure a dedicated PD in order to provide some administrative relief for those Co-PIs who served as full-time professors to properly fulfill their full-time departmental responsibilities. The PI and the Co-PIs promptly hired an experienced PD. Working strategically together... the Leadership Team and the PD made significant strides in remediating the problems that plagued the program in Phase I and the early stages of Phase II. To this point, Scholars consistently rated their experiences as positive. Indeed, those who had been in the program during the last three years, singled out the drastic improvement in their experiences at the annual symposium. Long-time and more recent research mentors complimented the effectiveness of the program in professional development opportunities for Scholars.

As shown in this report, the magnitude of progress in the last three years cannot be overstated. The organizational, managerial, and structural changes are beginning to bring the partnerships closer to a functioning, comprehensive Alliance. Although there has been measurable progress, there remains a need to build on the last three years’ success. The Alliance is at a critical stage that now requires each campus coordinator to take a more proactive role in advancing the program on their campus as well as working with the leadership team and other coordinators to create and implement innovative multi-campus events. In the final year of Phase II, the Alliance was successful in being awarded a grant for a third cycle of funding. This speaks to the strides made in the Phase II and the promise for continuing success in the next funding cycle.

Program Staff Roles

Project Director. The project director is responsible for the day-to-day activities of the program. The funding period began with an interim project director, Dr. JJ Jackson, UK Vice President for Institutional Diversity. Dr. Jackson left the university in Spring 2015. A new project director began October 1, 2015. Fara Williams came from Oklahoma where she worked for over eight years on the Oklahoma LSAMP program.

In her first year, Ms. Williams established communications to receive enrollment and degree data 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 enrollment and degree numbers beginning with the 2014-15 academic year. Duties of the project director include, but are not limited to: collecting and maintaining participant data, collecting and reporting enrollment and degree data, coordinating conference travel for participants across the alliance, creating reports for program administration and staff as well as the National Science Foundation, and supporting dissemination of best practices

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

Campus Coordinators. Campus coordinators are responsible for program activities as well as recruitment and retention of program participants. There were some changes in campus coordinators during the funding period. At the University of Louisville, Dr. V. Faye Jones assumed the LSAMP coordinator role after Dr. Pamela Feldhoff returned to her faculty and research role at the institution. At West Virginia State University, there were several changes – ultimately, Hannah Payne became the campus coordinator. At the University of Kentucky, Raúl Torres, was hired to serve as a part-time campus coordinator in Spring 2017. Beginning October 2018, he was hired as a full-time campus coordinator thanks to the acceptance of the third funding-cycle of the program.

Coordinators continue to excel in their discipline. Select examples of their activities can be found in the faculty and staff highlight section on page 23.

Coordinators have also begun to present LSAMP best practices at conferences and create publications for peer-reviewed journals. Select dissemination during the funding period can be found in the dissemination section on page 22.

Governing Board

The Governing Board, comprised 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. A video meeting of the Governing Board is set for September 11, 2019, at 1:30 pm.

External Advisory Board

An advisory board of professionals in higher education as well as research, diversity, and community organizations has been created. Members of the board provide expert advice on program activities and initiatives and represent a variety of backgrounds and experiences. Board members are listed in Table 4. Each year, board members review the KY-WV LSAMP Annual Report and provide feedback on program activities during a video meeting held in the fall. In the spring, board members are 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.

Table 4: Members of the External Advisory Board

| Name | Institution/ Organization | Discipline / Position | Expertise |
|---------------------------------|--|--|---|
| Bessie Guarrant – 2018 Chair | UK Office of Undergraduate Research | Associate Director | Research Experiences and Professional Development |
| Carolina Atkins | KY Council on Postsecondary Education | Chief Diversity Officer | Recruitment and Retention |
| Daniel Crockett | WV Higher Education Policy Commission | Director of Student and Educational Services | Recruitment and Retention |
| Charles Holloway | Morehead State University | Chief Diversity Officer | Diversity and Inclusion |
| Michael J. Lauer | STEAM Academy | Science Teacher | Academic Preparedness and Recruitment |
| Julia Roberts | Gatton Academy | Executive Director | Academic Preparedness and Recruitment |
| Sonia Sanders | KSU; Central Kentucky Diversity Consortium | Assistant VP for Public Engagement and Community Outreach; Board member | Diversity and Inclusion |
| Tina Stevenson | STEAM Academy | Director | Academic Preparedness and Recruitment |
| Jan Taylor | WV EPSCoR | Director | Research Experience and Professional Development |

Bessie Guarrant and Michael J. Lauer attended the 2018 symposium. Board members were provided the 2018 Annual Report, and an advisory board video meeting was held in September 2018. Bessie Guarrant, Michael J. Lauer, and Tina Stevenson attended the 2019 symposium. Board members were provided the 2019 Annual Report. A video meeting is scheduled for October 2019.

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. Some of the programs and businesses that have supported KY-WV LSAMP Scholars are:

Air Products and Chemicals – is a world-leading Industrial Gases company in operation for over 75 years. The Company’s core industrial gases business provides atmospheric and process gases and related equipment to manufacturing markets, including refining and petrochemical, metals, electronics, and food and beverage. Air Products is also the world’s leading supplier of liquefied natural gas process technology and equipment.

<http://www.airproducts.com/Company/company-overview.aspx>

General Motors, Detroit, MI – is passionate about earning customers for life. This vision unites us as a team and is the hallmark of our customer-driven culture.

<http://www.gm.com/company/company-overview.html>

Hensel Phelps, Phoenix, AZ – Plan. Build. Manage. From planning and design, to construction, and facility management, we work to solve our clients’ challenges from start to finish, and beyond. Our clients, both domestic and international, have entrusted us with a tremendous range of landmark projects, in nearly every market sector. <http://www.henselphelps.com/>

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

LSU iREU, France – the Louisiana State University international Research Experience for Undergraduates program sponsors students who are interested in projects that feature aspects of translational chemistry and incorporate major European “Innovation Campuses” where national laboratory, industry, and university scientists work as teams. This will provide students the opportunity to experience a network of research not typically available to students at most American colleges and universities. NSF #1263336

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://education.tropicalstudies.org/en/education/undergraduate-opportunities/programs/reu-research-experience-for-undergraduates-in-costa-rica.html>

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

Summer Health Professional Education Program (SHPEP) – The program at Louisiana State University is strongly committed to increasing the number of students from underrepresented/underserved, rural, and/or disadvantaged backgrounds who are skilled, confident, and motivated to remain and succeed in challenging academic programs/majors that are designed to support health sciences careers. <http://www.shpep.org/site/louisiana-state-university-health-sciences-center/>

UK Environmental Research Training Laboratories, Lexington, KY – The University of Kentucky and the College of Engineering recognize the need to enhance the statewide infrastructure for environmental studies. Open to users from throughout the university, ERTL is a hands on learning and research facility used for a variety of organic and inorganic analyses and microbial analyses. Established in March of 2002, ERTL's mission is to increase research opportunities and improve results by offering personalized training and access to state-of-the-art laboratory equipment and techniques. <http://ertl.uky.edu/>

USDA Wallace-Carver Fellowship – offers exceptional college students the opportunity to collaborate with world-renowned scientists and policymakers through paid internships at leading USDA research centers and offices across the United States. The fellows also participate in a high-level week-long Wallace-Carver Leadership Symposium at the US Department of Agriculture in Washington, DC, hosted by the US Secretary of Agriculture. https://www.worldfoodprize.org/en/youth_programs/usda_wallacecarver_fellowship/

Links to Existing Campus Programs and Campus Honors

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

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. <http://www.linksinc.org/>
http://bluegrass.kctcs.edu/en/Multiculturalism_and_Inclusion/Blinks.aspx

Carnegie Hall is a *one week intense summer immersion camp continuing throughout the year with semi-monthly Saturday learning activities*. The mission of Carnegie Hall is: *sparking an age of a generation who conquers all challenges, while remaining committed to success. Constructing mathematical and engineering thought processes so that the sciences and technological aspect lead to more success. Making others stronger, by forfeiting....NOTHING!*

http://bluegrass.kctcs.edu/Multiculturalism_and_Inclusion/Carnegie_Hall.aspx

Latino Leadership and College Experience Camp (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.*

http://bluegrass.kctcs.edu/en/Multiculturalism_and_Inclusion/Latino_Hispanic_Outreach/Camp.aspx

Multicultural Opportunities, Strategic and Institutional Inclusiveness Conference (MOSAIC) is a *time for candid and sustained dialogs on diversity and inclusion across higher education institutions in the Bluegrass area. This is a conference that is organized and funded by the Central Kentucky Diversity Consortium every year.* <http://www.uky.edu/studentacademicsupport/mosaic>.

Super Someday is an event to prepare high school students for selecting a college major and exploring career options. Charlene Walker, BCTC VP for Multiculturalism and Inclusion and LSAMP coordinator, completed career assessments with each student to help them in selecting and exploring career choices.

Centre College

The Posse Foundation has partnered with Centre College for over 10 years. It *has identified, recruited and trained 7,728 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 important, 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.

Centre was named as a 2018 Hidden Gem by *College Raptor*.

University of Kentucky

Center for Academic Resources and Enrichment Services (CARES) is a *division of the Office for Institutional Diversity. CARES’s mission is 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) 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.* <http://www.caer.uky.edu/energy/energy-research.shtml>

Engineering Broadening Participation Program is funded by the National Science Foundation and focuses on mentoring students from underrepresented populations at both the undergraduate and graduate level. Housed at the CAER, the program has three goals: *1) to motivate African American, Hispanic, and Native American students to choose engineering and help them graduate with engineering degrees, 2) to help these students acquire the skills they need to become engineering professionals, academics, leaders, and role models, and 3) to investigate if mentoring in research centers offers advantages over mentoring in traditional engineering departments.* <http://enr-mentoring.caer.uky.edu/about.html>

NerdSquad makes science an experience; bringing it to life, making it tangible so it becomes real, relatable and above all memorable. LSAMP Scholars in Lexington volunteer with this non-profit organization that provides hands-on science activities and mentoring to K-12 students. KY-WV LSAMP Scholars are also mentored by Cagney "CC" Coomer, NerdSquad founder, who is a UK biology Ph.D. candidate and Lexington community leader. <https://www.facebook.com/NERD-SQUAD-1429006443980870/>

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). <http://www.uky.edu/academy/UGResearch>

STEAM Academy was created through a grant awarded by EDUCAUSE and the Gates Foundation as part of the Next Generation Learning Challenge (*More information here: <http://www.educause.edu/focus-areas-and-initiatives/teaching-and-learning/next-generation-learning-challenges>*). This grant was awarded to STEAM due to the partnership with the University of Kentucky and particularly the College of Education Faculty and was used to construct the innovational foundations for STEAM. University of Kentucky Faculty are helping to create the infrastructure and instructional model for STEAM. As content experts, faculty members provide training for classroom teachers across a range

of instructional innovations including project-based learning, design thinking, digital literacy, and blended learning. Pre-service teachers, master teachers and faculty all work together in this innovative learning environment. Dual enrollment opportunities, internships, as well as multiple events at the University of Kentucky campus throughout the high school curriculum, will ensure that STEAM students graduate ready for college and careers. <https://sites.education.uky.edu/steam/>

STEMCats, is a Howard Hughes Medical Institute (HHMI) funded initiative. STEMCats is a pre-Fall freshmen academic, research and professional-development residential program. This living learning program is intended for first year students who have applied for a STEM major or who are interested in a STEM major plus a small cohort of transfer students from the Bluegrass Community and Technical College. STEMCats is supported by the College of Arts and Sciences, Pharmaceutical Sciences, Physiology, Molecular & Biomedical Pharmacology, and the Division of Natural Sciences at Bluegrass Community and Technical College. STEMCats will make for a smoother transition for first year and transfer students coming to UK. <https://stemcats.as.uky.edu/stemcats-about-us>

University of Louisville

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 under-served/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. <http://louisville.edu/research/students/srop/details>

West Virginia University

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.

Programs on Multiple Campuses

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 types of support have included, but is not limited to: direct 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 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.

The University of Kentucky, University of Louisville, and West Virginia University were selected for the 2017 and 2018 HEED Awards. The University of Kentucky was selected as a 2017 and 2018 HEED Diversity Champion. ***INSIGHT Into Diversity Higher Education Excellence in Diversity (HEED) Award.*** The HEED Award and the Health Professions HEED Award *are the only national awards that honor individual institutions for being outstanding examples of colleges, universities, or health profession schools that are committed to making diversity and inclusion a top priority across their campuses. Sharing this important recognition with your campus and community helps showcase your school's excellence in developing innovators and leaders for today's global workforce.*

<http://www.insightintodiversity.com/about-the-heed-award/>

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 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.

Cyber-Sharing

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

The Facebook group continues to grow. Though it has not, yet, gained adequate participation, it will aid in conversations regarding accomplishments and opportunities. Information and questions may be posted by anyone who is a member of the Facebook group. Scholars are encouraged to post questions to each other and to other members of the group including faculty mentors and graduate students. The possibilities are endless. <https://www.facebook.com/groups/750676201700146/>

KY-WV LSAMP now has Twitter and Instagram accounts. Social media will be utilized more in the new phase of the program.

@KYWVLSAMP, <https://twitter.com/KYWVLSAMP>

<https://www.instagram.com/kywvlsamp/>

Dissemination

There have been several avenues for dissemination. KY-WV LSAMP continues to update the program website by continuing to add resources for Scholars, faculty mentors, and program staff. There continues to be plans for Co-PI's, campus coordinators, and the project director to submit abstracts to conferences and continue working on articles for peer-reviewed journals. Examples of dissemination during the five years of the grant are:

- Dr. David Miller, WVU Co-PI and Coordinator, submitted a publication on the Emerging Scholars Program (ESP) at WVU. The ESP calculus classes are taught through cooperative learning rather than lecture. "An Active Classroom: The Emerging Scholars Program at West Virginia University" was written by Jessica Deshler, David Miller, and Matt Pascal and published in *Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS)*.
<http://dx.doi.org/10.1080/10511970.2016.1191570>
- Dr. Miller's article was selected by West Virginia University to be made into a comic strip. This graphic can be found in Appendix C
- Dr. Kazi Javed, KSU Co-PI and Coordinator, presented on a panel at the Louis Stokes Midwest Center of Excellence (LSMCE) Conference, October 28-29, 2016. There, he discussed the procedures and success of the Peer Led Team Learning (PLTL) activities.
- Dr. David Miller, presented at the 2017 LSMCE Conference. He talked about the ESP program and the success of the classes.
- Sarah Hodges, UK Scholar, and her mentor, Dr. Eduardo Santillan-Jimenez, presented at the 2017 LSMCE Conference. They discussed the benefits and preparations for conducting international research.
- Dr. Kazi Javed, KSU Co-PI and Coordinator, presented at the 2018 Lilly Conference, January 2018. There, he again discussed the procedures and success of the PLTL activities.
- Dr. Kazi Javed submitted an abstract to present a Faculty Administration Network (FAN) session at the 2018 National Conference on Undergraduate Research (NCUR). Fara Williams gave the presentation about PLTL.
- Charlene Walker, BCTC Coordinator, and Raúl Torres, UK Coordinator, presented at the High Impact Practices (HIPs) in the States National Conference, Bowling Green, KY, February 2019. Dr. Kazi Javed and Fara Williams assisted with the creation of the abstract and presentation.

Proposal for Continued Funding

In January 2018, KY-WV LSAMP submitted a proposal for continued funding. A major change to the program is the addition of another community college. Jefferson Community and Technical College (JCTC) was added to the KY-WV LSAMP alliance with the next cycle of the program. This addition was made at the request of the external evaluators and will add new energy, participants, and potential collaborations for JCTC as well as the rest of the alliance. JCTC is located in Louisville, Kentucky, and has the largest number of URM students enrolled in community college STEM programs in Kentucky and West Virginia. We are excited to add JCTC to the KY-WV LSAMP family.

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. Some highlights include:

Dr. Charles McGruder, WKU campus coordinator, attended the 100th Birthday Celebration of Dr. Richard Feynman (one of Dr. McGruder's professors during his undergraduate studies). He also gave two presentations at the General Assembly of the International Astronomical Union in Vienna, August 2018.

Dr. David Miller, WVU Co-PI and campus coordinator, was promoted to full professor.

Dr. Johné Parker, UK Co-PI, served as a keynote speaker at the 12th Annual Peach State LSAMP Symposium and Research Conference in Atlanta, GA, October 2017.

Charlene Walker, BCTC campus coordinator, received numerous awards for her leadership not only on her campus, but in the Lexington community. These honors include the Urban League of Lexington Individual Champion of Diversity award (2015).

Fara Williams, project director, participated in UK Human Resources professional development training sessions. These include completing the Essential Leadership and SuperVision programs.

Dr. John Wilson, Centre campus coordinator, was selected as the Centre College Diversity and Inclusion Faculty Fellow in 2017.

SCHOLAR and ALUMNI HIGHLIGHTS

Conferences and Symposia

There were conferences that were attended by Scholars from multiple campuses. In some cases, travel for these events was coordinated in order to provide opportunities for Scholars on different campuses to meet and interact with one another. Participation in many of these events has grown significantly. Below are tables representing scholar attendance by institution for some of these events. Other conferences to which scholars are encouraged to submit abstracts include, but are not limited to: the Annual Biomedical Research Conference for Minority Students (ABRCMS), the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), Kentucky and West Virginia Academy of Sciences, Louis Stokes Midwest Regional Center of Excellence (LSMRCE), Kentucky Posters at the Capitol, West Virginia

Research Day at the Capitol, and the Emerging Researchers National (ERN) Conference as well as discipline specific events recommended by their mentors and local research presentation opportunities.

The National Conference on Undergraduate Research (NCUR)

The National Conference on Undergraduate Research (NCUR) is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study by sponsoring an annual conference for students. Unlike meetings of academic professional organizations, this gathering of student scholars welcomes presenters from all institutions of higher learning and from all disciplines. Through this annual conference, NCUR creates a unique environment for the celebration and promotion of undergraduate student achievement; provides models of exemplary research, scholarship, and creative activity; and helps to improve the state of undergraduate education. Each conference hosts 3,500 to 4,000 students from across the globe, presenting their research through posters, oral presentations, visual arts, and performances. Their faculty mentors also attend, often presenting in the Faculty-Administrator Network (FAN) sessions.

<https://www.cur.org/what/events/students/ncur/info/>

Table 5 shows the number of KY-WV LSAMP scholars who attended NCUR by year and institution.

Table 5: NCUR Attendees by Year and Institution

| National Conference on Undergraduate Research | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|--|----------|----------|----------|-----------|
| BCTC | 0 | 0 | 0 | 0 |
| Center | 0 | 0 | 0 | 0 |
| JCTC | NA | NA | NA | 0 |
| KSU | 1 | 0 | 0 | 2 |
| Marshall | 0 | 0 | 0 | 0 |
| UK | 3 | 1 | 3 | 2 |
| UofL | 0 | 1 | 0 | 0 |
| WVSU | 0 | 0 | 0 | 0 |
| WVU | 0 | 0 | 1 | 3 |
| WKU | 2 | 2 | 4 | 3 |
| TOTAL | 6 | 4 | 8 | 10 |

The Women of Color STEM (WOC) and Black Engineer of the Year Award (BEYA) Conferences

Both BEYA and WOC have programming for college students organized by the Career Communications Group (CCG). KY-WV LSAMP began taking Scholars to WOC in October 2016. BEYA attendance began in February 2018. Table 6 shows the number of KY-WV LSAMP scholars who attended the Women of Color STEM Conference by year and institution. Table 7 shows the number of KY-WV LSAMP scholars who attended Black Engineer of the Year Award Conference by year and institution.

The CCG College Program for STEM Students is a comprehensive student leadership program designed to give students a competitive edge when they enter the work force. There are two (2) components to this program. The CCG Development Institute for Emerging Leaders (DIEL) is where leaders are groomed for today's workplace challenges. DIEL creates a forum where high achieving, goal-oriented students

majoring in science, technology, engineering, and math-based (STEM) disciplines can learn, interact, and build professional networking relationships with outstanding leaders in fields that complement their academic studies. The Jobs Certification Program is a two-day program at either of our conferences, offering in-depth and interactive soft-skills workshops. The workshop topics include interpersonal skills, critical thinking, interview skills, business etiquette, team building skills, navigating multi-generational challenges, as well as online courses. When students complete the Job Certification Track, we issue a certificate of completion that students can include on their resumes. Employers at our conferences recognize this certification and will fasttrack students for interviews. Online courses are available to all students at our website. <https://www.ccgelearning.com/>

Table 6: Women of Color STEM Conference Attendance by Year and Institution

| Women of Color STEM Conference | 2016-17 | 2017-18 | 2018-19 |
|---------------------------------------|-----------|-----------|-----------|
| BCTC | 0 | 0 | 0 |
| Center | 0 | 2 | 0 |
| JCTC | NA | NA | 0 |
| KSU | 0 | 0 | 0 |
| Marshall | 5 | 7 | 6 |
| UK | 1 | 3 | 10 |
| UofL | 5 | 1 | 14 |
| WVSU | 0 | 2 | 0 |
| WVU | 0 | 0 | 0 |
| WKU | 1 | 0 | 0 |
| TOTAL | 12 | 15 | 30 |

Table 7: BEYA Attendance by Year and Institution

| Black Engineer of the Year Award (BEYA) Conference | 2016-17 | 2017-18 | 2018-19 |
|---|----------|-----------|-----------|
| BCTC | 0 | 0 | 0 |
| Center | 0 | 0 | 0 |
| JCTC | NA | NA | 0 |
| KSU | 0 | 0 | 0 |
| Marshall | 0 | 4 | 6 |
| UK | 0 | 5 | 19 |
| UofL | 0 | 1 | 1 |
| WVSU | 0 | 0 | 0 |
| WVU | 0 | 0 | 1 |
| WKU | 0 | 0 | 0 |
| TOTAL | 0 | 10 | 27 |

Highlighted Individual Accomplishments

Many Scholars made accomplishments and received honors throughout the funding period. Below are select examples of KY-WV LSAMP Scholar accomplishments.

Mohanad Abdallah, UK, conducted research in Germany summer 2018 for a Research Internship in Science and Engineering from the German Academic Exchange Service. In addition, he presented at the European Association for Renewable Energy Conference in Dusseldorf, Germany, March 2019.

Zita Ackah, UofL, completed her BS in chemical engineering and continued her education in a MS engineering program at UofL.

I. Khalil Appleton, UK, participated in a study abroad to Japan summer 2017. He graduated and is now working in industry.



Ky'Achia Atkins, WVSU, presented a poster at the LSU iREU Meeting, Toulouse, France, June 25-30, 2018.

Edwina Barnett, WVSU, (1) presented at the LSU iREU Meeting, Bordeaux, France, July 2017; (2) participated in the Organization for Tropical Studies REU in Costa Rica summer 2018; and (3) has begun graduate school at Tennessee State University.



Lloyd Bartley, UofL, presented a poster at the LSU iREU Meeting, Toulouse, France, June 25-30, 2018, and participated in the LSU iREU program in Toulouse, France, summer 2019.

Kaylind Batey, Centre, participated in the MD/PhD REU at the University of Rochester, Summer 2016. He was listed as third author on a publication, "The Notch Ligand Jagged 1 Regulates the Osteoblastic Lineage by Maintaining the Osteoprogenitor Pool." He participated in a post baccalaureate Intramural Research Training Award fellowship after graduation.

Grayce Behnke, Marshall, was listed as an author on two articles submitted for publication in peer reviewed journals.

Noela Botaka, UofL, received a 2019 Fulbright Research Award and traveled to Belgium.

Deja Bowen, UK, completed her BS degree and continued to graduate study at Xavier University.

Lecia Brown, UofL, was a professional volleyball middle blocker after graduating with her BS in biology. She continued her education to receive a MS in health services / allied health / health sciences and is now pursuing her Ph.D. in neuroscience from the University of South Florida.

Brittany Brush, WVU, completed her BS in geology and is working on graduate degrees in civil engineering.



Danielle Chavis, WKU, participated in the LSU iREU program during summer 2017. She spent the summer in Puerto Rico conducting research on art conservation. After completing her chemistry BS degree, she participated in a teacher program.

Trevor Claiborn, BCTC and KSU, is also known as Farmer Brown tha' MC and continues to be featured by various media. He frequently presents to K-12 students and teachers including attendees of the KY-WV LSAMP 10th Annual Research Symposium. Trevor received numerous awards including the Kentucky Association for Environmental Education Outstanding Rising Star for Excellence in Environmental Education and the 2016 MOSAIIIC (Multicultural Opportunities, Strategies, and Institutional Inclusiveness Conference) award. This award is given to a BCTC faculty or staff member, a student, a community member, or an institution with a proven commitment to diversity. Trevor completed his BS degree in December 2017 and continues to work on the KSU research farm while pursuing graduate degrees at the University of Kentucky.

Tat'Ana Dillard-Sims, WVSU, presented a chromatography lesson to 100 female K-12 students in the local community.

Sabita Dumre, UK, was accepted to medical school at Lincoln Memorial University.

Sajana Dumre, UK, participated in a study abroad to Spain summer 2018.

Taylor Fisher, UofL, was accepted to present at the LSU iREU Meeting, Toulouse, France, June 2018.



Makaylah Garrett, KSU, was listed as an author on an article, "Effect of Cu promotion on cracking and methanation during the Ni-catalyzed deoxygenation of waste lipids and hemp seed oil to fuel-like hydrocarbons," published in *Catalysis Today*. She graduated May 2018.

Jordan George, UK, attended the Alltech One19 Ideas Conference, an international event in Lexington, KY, May 2019. After completing her BS degree, she accepted a position with IBM.

Lynnora Grant, WVU, received the NSF Graduate Research Fellowship and is attending Rice University for graduate study.

Evander Harris, Centre, completed his degree in physics in May 2016 and was accepted to a science education MS program at the University of Kentucky.

Miguel Henriquez, WVU, is pursuing a physics graduate degree at WVU.



Sarah Hodges, UK, (1) conducted research in Grenoble, France during summer 2017 thanks to the LSU iREU program; (2) presented at the LSU iREU Meeting, Bordeaux, France, July 6-8, 2017; (3) has given several oral presentations about preparing for and participating in international research; (4) served as a student leader for the 2018 LSU iREU in France; and (5) is pursuing an MBA at UK.

Victor Holness, UK, conducted research in France summer 2019.

Onyee Ibekwe, UK, participated in a study abroad to Spain in summer 2017.

Fabian Leon, UK, received a Wallace-Carver Fellowship to conduct research during summer 2017 with the Agriculture Research Service at the National Laboratory for Agriculture and the Environment in Ames, IA.

Scott Lopez, WVU, received the Boren Scholarship and spent a year learning the language and culture of a country that has been identified as critical to US interests. He received intensive language training at the Beijing Language and Culture University summer 2018, then studied at Tsinghua University.



Courtney McKelphin, UK, received a Student Leadership Award at the Women of Color STEM Conference in 2016. She completed her BS in chemical engineering in 2017. She is now working in industry while she also completes her MS degree in project management at the University of Kansas.



Je'Coiya Moore, Centre, participated in a study abroad to China, fall 2018. While there, she conducted research at the Shanghai School of Medicine Fudan University. Her research focused on epidemiology and public health. She conducted lab experiments and worked with TB patients in a hospital and rural settings.

Charlie Nelson, BCTC and KSU, completed his BS degree and was accepted for the MS program at the University of Louisville.

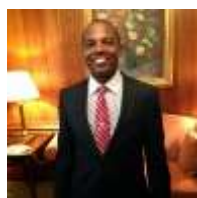


Asare Nkansah, UK, conducted international research in Bordeaux, France, through the LSU iREU program summer 2018. He attended the Alltech One19 Ideas Conference, an international event in Lexington, KY, May 2019. Asare is now pursuing his PhD in computer science at UK.

Darian Parker, UK, conducted international research in France, summer 2019.

Jordan Potts, UofL, completed a BS in environmental engineering and continued his education for a MS.

Raven Robinson, KSU, pursued a teaching career after completing her mathematics degree.



Larry Rush, WVU, received his BS in mathematics, chemistry, and physics. He is currently working as a theoretical/computational condensed matter physicist while pursuing a MS in physics from Wake Forest University. *“I am very thankful for my experience as a past LSAMP student, because I remember a time when Dr. Miller waited all night for an event that I was part of as an undergraduate so he could then transport me to where the WV-KY LSAMP research symposium was being held, somewhat close to midnight. It demonstrated that he and the LSAMP community really cared about providing me with opportunities to thrive as a student and scientist-in-training.”*



Dr. Astrid Suarez, WKU, continued her education by completing an MS and Ph.D. from Pennsylvania State University. She is now working as a meteorologist at the Air Force Technical Applications Center at Patrick Air Force Base near Melbourne, Florida. She will provide the keynote address at the 2020 KY-WV LSAMP Annual Research Symposium.

Karen Udoh, UofL, was selected as a 2018 Fulbright Scholar and studied in Greece.



Taylor Walker-Smith, Centre, completed her BS degree and continued her education at the University of Louisville where she is working on her dental degree.

Dr. Joseph Wilkins, UofL, completed his Ph.D. in meteorology from the Department of Earth and Atmospheric Sciences at Saint Louis University. He is now working for the Environmental Protection Agency in the Research Triangle Park, Raleigh-Durham, North Carolina.

RESOURCES

1) Source of URM population data: Kaiser Family Foundation estimates based on the Census Bureau's March 2015 Current Population Survey (CPS: Annual Social and Economic Supplement).

APPENDIXES

APPENDIX A
INTERNATIONAL RESEARCH
TRAVEL CHECKLIST

International Research Travel Checklist

Travel information

| Departing Flight Booked <input type="checkbox"/> | Amount of Luggage Allowed: | Returning Flight Booked <input type="checkbox"/> | Amount of Luggage Allowed: |
|---|----------------------------|---|----------------------------|
| Time to Arrive at Airport: | Airport Address: | Time to Arrive at Airport: | Airport Address: |
| Time of First Flight: | Time of Final Landing: | Time of First Flight: | Time of Final Landing: |
| Mode of Transportation to Destination: <input type="checkbox"/> Car/ Rental Car <input type="checkbox"/> Taxi <input type="checkbox"/> Train <input type="checkbox"/> Bus | Destination Address: | Mode of Transportation to Destination: <input type="checkbox"/> Car/ Rental Car <input type="checkbox"/> Taxi <input type="checkbox"/> Train <input type="checkbox"/> Bus | Destination Address: |

STUDENT VISA (For 90+ days abroad, Arrange 7-12 weeks before arrival)

| | | |
|--|---|--|
| <input type="checkbox"/> Campus France Application | Identity photo Passport Permanent Address Program Description Validating document from host Research Institution | Resume Language Proficiency \$180.00 3 week processing fee OR \$330.00 3 day processing Signed and Scanned Service Form |
| <input type="checkbox"/> Visa Application | Visa Appointment (within three month of leaving the US, no less that three weeks before leaving) Valid Original Passport Proof of travel medical insurance (\$50,000 minimum) Proof of Financial Means US permanent residence card (non US citizens only) | Completed Application form Completed and Approved Campus France Application Travel Itinerary (Do not purchase tickets) Pre-paid express mail envelope addressed to yourself Passport sized photo (Passport photo restrictions apply) |

Internship Visa (Any period of time) (Arrange 4-12 weeks before arrival)

| | | |
|---|---|--|
| <input type="checkbox"/> Visa Application | Visa Appointment (within three month of leaving the US, no less that three weeks before leaving) Valid Original Passport US permanent residence card (non US citizens only) Processing fee \$71.00 (in Cash) Completed Application Form | "Convention de Stage" completed form (Can be found on visa application website) Proof of Financial means or payment agreement Pre-paid express mail envelope addressed to yourself Passport sized photo (Passport photo restrictions apply) |
|---|---|--|

International Communication (only check 1, Arrange 2-3 weeks before arrival)

- Contact phone service provider about unlocking cell phone (Necessary if you plan to purchase an international SIM card) and canceling service for months abroad
- Contact domestic phone service provider about a short term or long term international plan

International Housing (Arrange 4-8 weeks before arrival)

- Arrange for Arrival (keys, entrance pass, etc.)
- Pack or plan to buy housing items (linens, pillows, dishes, towels, etc.)
- Pay housing deposit, fees and/or first rent
- Plan route from housing to workplace
- Read housing reviews and amenities

International Banking (2-4 weeks before arrival)

- Acquire small amount of foreign currency before departure from US (can be done at an international airport or ordered through a domestic bank)
- Collect required materials for opening a bank account (Some banks will require a copy of your birth certificate)
- Notify Domestic bank of travel and all credit card companies
- Research international banking system (compatible with US bank or not compatible)
- Research requirements for setting up a bank account
- Purchase a prepaid travel card (recommended)

Insurance and Medical Needs (1-4 weeks before arrival)

- Check CDC recommended vaccinations and health risks for host country
- Check foreign national requirements for insurance (some countries require civil insurance, recommend purchasing through a local company in host country)
- Check international coverage on current medical insurance or purchase medical insurance in host country.
- Purchase Traveler's insurance

What to Pack

MEDICATIONS

NOTE: BEFORE PACKING ANY MEDICATIONS CHECK WHICH DRUGS ARE ALLOWED OR NOT ALLOWED IN HOST COUNTRY. ALL MEDICATIONS SHOULD BE IN ORIGINAL PACKAGING.

ALLERGY MEDICATIONS

COMMON COLD MEDICATIONS

DAILY MEDICATIONS (SUPPLY FOR THE DURATION OF YOUR STAY)

EMERGENCY MEDICATIONS (EX. EPIPEN, INHALER)

MULTIVITAMINS

MOTION SICKNESS/ ALTITUDE SICKNESS DRUGS

PAIN MEDICATION

Clothing

Note: Check weather averages for the entire duration of your stay in the host country.

Belt

Business Pants/ Skirts

Business Shirts

Casual Lab Appropriate Shirts

Casual Long Pants

Casual Shorts

Exercise bottoms

Exercise tops

Formal/ Business Shoes

Glasses/ Sunglasses

Outdoor Jacket

Pajama bottoms

Pajama tops

Rain Jacket

Swimsuit or swim trunks

Socks

Sweater(s)

Undergarments

Toiletries

Note: Most things can be bought in host country, bring for 1-2 weeks.

Contacts and contact solution

Deodorant

Feminine Hygiene Products

Floss

Formal/ Business Shoes

Laundry Detergent

Lotion

Mouthwash

Shaving kit/ Razor

Face wash

Hair Accessories

Hair comb/ brush

Makeup and makeup remover

Personal Hygiene items

Sunscreen

Shampoo and Conditioner

Toothbrush and toothpaste

Toilet paper

- | | | |
|---|---|--|
| <input type="checkbox"/> LINENS NOTE: SOME MAY BE PROVIDED BY OR CAN BE RENTED FROM THE HOUSING ESTABLISHMENT; OTHERS CAN BE BOUGHT IN THE HOST COUNTRY. | BLANKET (TRAVEL SIZE) EYE/SLEEP MASK HAND DRY TOWEL PILLOW | PILLOW CASE SHEET SET TRAVEL PILLOW WASHCLOTH AND TOWEL SET |
|---|---|--|

- | | | |
|--------------------------------------|--|------------------------------|
| <input type="checkbox"/> Electronics | Camera Plug Adapter/ Converter Phone charger | Laptop/ Tablet Headphones |
|--------------------------------------|--|------------------------------|

- | | | |
|---|---|--|
| <input type="checkbox"/> Travel Documents | Birth Certificate (if needed) Flight Itinerary Documentation of Insurance Host country housing documents | Passport Personal ID/ Drivers License Student ID Visa documentation |
|---|---|--|

Important Contacts

| | | |
|--|--|--|
| LSAMP Campus Coordinator Name: Phone Number: Email: | Campus Study Abroad Office Contact Person: Phone Number: Email: | REU/Program Coordinator: Name: Phone Number: Email: |
|--|--|--|

Recommended Steps:

- Register with the State Department Smart Traveler Enrollment Program
 The Smart Traveler Enrollment Program notifies the nearest US embassy to your location abroad of your presence in that country. The State Department will notify you of any relevant information to your safety such as: terrorist's attacks or heightened possibility of terrorist attacks, natural disasters, disease outbreaks, and travel warnings.
 Enroll at: <https://step.state.gov/step/>
- Register with Study Abroad office
 Some study abroad offices keep a list of all students abroad, regardless of the program you are participating in. This provides a second safety net while abroad and may consist of: additional security alerts, medical coverage while abroad, and a network of resources while abroad.
- Talk to your on campus Financial Aid advisor, Office of Undergraduate Research, or Study Abroad Office
 Some universities have money set aside for students wanting to travel abroad to do research. Often one or multiple of the listed offices will be able to inform you of the amount available, conditions, and deadlines associated with receiving financial support for your research abroad.

Additional To-Do List

| | |
|--------------------------------|--------------------------------|
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

APPENDIX B

KY-WV LSAMP MID-LEVEL ALLIANCE
SUMMATIVE EVALUATION
SUBMITTED BY
DR. WILLIE PEARSON JR.,
MR. ED MARSHALL, &
DR. CHERYL B. LEGGON

KY/WV LSAMP Summative
Evaluation Report: 2013-2018

Prepared by

Willie Pearson, Jr., Ph.D.
External Evaluator

with assistance from
Edward Marshall, M.A.
Cheryl B. Leggon, Ph.D.

Submitted to:

Eli Capilouto, University of Kentucky, PI
and
Johne Parker, University of Kentucky, Co-PI
David Miller, West Virginia University, Co-PI
Kavi Javed, Kentucky State University, Co-PI
Quentin McMeans, West Virginia State University, Co-PI

September 23, 2019

EXECUTIVE SUMMARY

Phase II of the KY-WV Louis Stokes Alliance for Minority Participation (LSAMP) Program, funded by the National Science Foundation, aims to build on achievements of Phase I of the grant—i.e., further enhancing the participation of underrepresented racial minority (URM) populations in science, technology, engineering and mathematics (STEM)-related academic majors and careers. Among the goals of Phase II were to address some of the challenges associated with Phase I, including increasing the quality and quantity of students from URMs receiving baccalaureate degrees in STEM fields and increasing the number of URMs attending graduate school or entering the STEM workforce upon receipt of a STEM degree (KY-WV LSAMP Phase II Proposal).

A gap associated with the funding between Phase I and Phase II of the grant led to disruptions in program management at some institutions, including the lack of a Project Director (PD) at the lead institution. However, based on recommendations from external evaluators, a PD was hired in 2015. This has resulted in operational changes that were immediately apparent to and embraced by Alliance partners, including enhanced communication and streamlined data management. Nevertheless, substantial and measurable progress has been made with the enhancement of the Alliance website, allowing general information, forms and documents to be readily accessed.

During the last three years of Phase II, some 211 Scholars completed e-surveys and 60 participated in focus group interviews. In terms of demographics, 65 percent of the respondents self-identified as female and 70 percent self-identified as Black or African American. Of the 39 who self-identified by race and ethnicity (i.e., Hispanic), 41 percent self-identified as White. A substantial majority (86 percent) of Scholars majored in the life/biological sciences; followed by engineering (21 percent). Both majors, however, were highly gendered with females comprising 81 percent of the life/biological sciences majors, while males accounted for 60 percent of those majoring in engineering.

Additionally, focus groups were held with approximately 60 Scholars and 22 research mentors. In-person interviews were conducted with five department chairs, nine institutional program staff, seven senior administrators (e.g., provosts, deans, and vice presidents) and five university staff who provided support services to their program. Each year, in-person interviews were conducted with the Program Director. In-person interviews were conducted with Co-PIs when the evaluators conducted site visits at their institution. During the annual symposium, informal interviews were conducted with students.

For the purpose of this summative evaluation report, it is critical to contextualize the status of the Alliance. When the current external evaluator was contracted in 2015, no external evaluation had been conducted for the first two years of Phase II. While some success occurred during Phase I, most institutional representatives and faculty research mentors described Phase I as largely *chaotic* and *dysfunctional*.

Although Phase II sought to build on some of the successes of Phase I, the primary focus was on remediating the significant challenges that obstructed the functioning of the program as a comprehensive, integrated “alliance.” The most critical observation made by the external evaluation team was the need for a full-time, dedicated PD. The absence of this person was at the core of many of the challenges confronting the Alliance. It was essential to secure a dedicated PD in order to provide some administrative relief for those Co-PIs who served as full-time professors to properly fulfill their full-time departmental responsibilities. The PI and the Co-PIs promptly hired an experienced PD. Working strategically together... the Leadership Team and the PD made significant strides in remediating the problems that plagued the program in Phase I and the early stages of Phase II. To this point, Scholars consistently rated their experiences as positive. Indeed, those who had been in the program during the last three years, singled out the drastic improvement in their experiences at the annual symposium. Long-time and more recent research

mentors complimented the effectiveness of the program in professional development opportunities for Scholars.

As shown in this report, the magnitude of progress in the last three years cannot be overstated. The organizational, managerial, and structural changes are beginning to bring the partnerships closer to a functioning, comprehensive Alliance. Although there has been measurable progress, there remains a need to build on the last three years' success. The Alliance is at a critical stage that now requires each campus coordinator to take a more proactive role in advancing the program on their campus as well as working with the leadership team and other coordinators to create and implement innovative multi-campus events. In the final year of Phase II, the Alliance was successful in being awarded a grant for a third cycle of funding. This speaks to the strides made in the Phase II and the promise for continuing success in the next funding cycle.

INTRODUCTION

While there has been some progress, African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders (collectively referred to as underrepresented racial/ethnic minorities or URM) continue to be underrepresented at each level of science, technology, engineering and mathematics (STEM) education and the workforce (Pearson and Fechter, 1994; Pearson and Miller, 2012; National Research Council, 2011; CEOSE, 2011; National Science Foundation, 2019; Slaughter, Tao, and Pearson, 2015; National Academies, 2016; Hrabowski and Henderson, 2017, 2019). A number of federal and private foundation efforts have been implemented to increase the participation of URM in STEM disciplines and careers (BEST, 2004; National Research Council, 2005, 2011). There is strong evidence that a high-quality undergraduate research experience and mentoring play significant roles in recruiting and retaining URM in STEM disciplines and careers (Leggon and Pearson, 2010; Chemers et al., 2011; Ghee et. al, 2014).

The National Science Foundation's Louis Stokes Alliance for Minority Participation (LSAMP) Program seeks to proactively encourage greater participation of URM in STEM disciplines, especially during the undergraduate years. In 2006, Phase 1 of the KY-WV Alliance (hereafter Alliance) began by establishing a relationship among 10 diverse academic institutions, two state EPSCoR programs, and the undergraduate research and diversity programs at the partner institutions. During Phase 1, some success occurred in the areas of outreach and recruiting, peer mentoring, as well as summer bridge transitional programs for entering students, and curricular reforms in science and mathematics "gatekeeper" courses. However, the Alliance was not as successful in increasing the recruitment of Hispanic students, improving project management, enhancing faculty development, implementing a new cyber-enabled project component, and the communication/sharing of information between campuses.

Generally, the major initiatives in Phase II were aimed at aggressively increasing the quality and quantity of students from URM receiving baccalaureate degrees in STEM fields, as well as increasing the number of URM attending graduate school or entering the STEM workforce upon receipt of a STEM degree (KY-WV LSAMP Phase II Proposal).

The primary purpose of this summative evaluation report is to assess the extent to which the KY-WV Alliance addressed external evaluation recommendations and significant challenges identified by all stakeholders. This report is organized in three sections: (1) methodology, (2) findings and (3) conclusions.

METHODOLOGY

This summative evaluation plan called for data collection using a mixed method approach--quantitative and qualitative (Gorden, 1987; Clewell and Fontenberry, 2009; Babbie, 2014; Berg and Lune, 2012; Booth, Colomb, and Williams, 2008; Frankfort-Nachmias and Leon-Guerrero, 2015; Neuman, 2011; Posava and Carey, 2007; Fichtling, 2010; Mertens, 2019). Each year in consultation with the Project PD, three partner institutions of varying Carnegie classifications, geographical location and student demographic composition were selected for case studies, including site visits. 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. Over the summative period, e-surveys were submitted to a total of 211 student participants (Scholars), with an overall response rate of 47 percent. Of the 211 respondents, 208 or 98.5 percent provided race, gender and major field data. Women accounted for 65 percent of the respondents. Among racial groups, Blacks or African Americans accounted for a majority (70 percent); followed by Whites and *others (28 percent), and American Indians or Native Americans (1 percent). Thirty-nine of the students self-identified by race and ethnicity—Hispanic. Of those, self-identified as Hispanic, (41 percent) self-identified as Hispanic—White; and a majority (61 percent) of these were females. In terms of majors, most students indicated the life/biological sciences (86 percent); followed by engineering (21 percent). The responses were highly gendered with 81 percent of those majoring in the life/biological sciences being females, while White males accounted for 60 percent of engineering majors. The surveys included both scaled (usually a 5-point scale-5=highest) and opened-ended items. *Asian Americans, Pacific Islander, no-designation, and three races.

Qualitative data were gathered from in-person individual interviews with program staff, and institution administrators and staff, and focus group interviews with research mentors and students. During the three-year, summative period, in-person interviews were conducted with seven institutional senior administrators, five department chairs, five university staff who provided services to the program and nine program staff. Focus groups were conducted with 60 students and 22 faculty research mentors. Additionally, informal student interviews were conducted with Scholars and research mentors during each annual symposium. All respondents granted either written or oral consent.

FINDINGS

For the purpose of this summative evaluation report, it is critical to contextualize the status of the Alliance. When the current external evaluator was contracted in 2015, no external evaluation had been conducted for the first two years of Phase II because the external evaluator and PD resigned or departed the institution.

It is important to briefly summarize the transition of the Alliance from Phase I to Phase II. The Alliance began in 2006 (Phase I), establishing a relationship among ten diverse academic institutions, two state EPSCoR programs, and the undergraduate research and diversity programs at the partner institutions. While some success occurred during Phase I, most institutional representatives and faculty research mentors described Phase I as largely chaotic and dysfunctional. Aspects of Phase I that proved particularly challenging included:

- recruitment from Hispanic communities
- project management
- research mentor development
- data quality and integrity
- external evaluation

- implementation of a cyber-enabled project component and
- communication and sharing of information between campuses.

Although Phase II sought to build on some of the successes of Phase 1, the primary focus was on remediating the significant challenges that obstructed the functioning of the program as a comprehensive, integrated “alliance.” Timeliness of the initial Phase II funding, and the lack of a full-time PD, negatively impacted the ability of the Alliance to gather designated baseline data to assess key goals, objectives, and activities. The most critical observation made by the external evaluation team was the need for a full-time, dedicated PD. The absence of this person was at the core of many of the challenges confronting the Alliance. It was essential to secure a dedicated PD in order to provide some administrative relief for those Co-PIs who served as full-time professors to properly fulfill their full-time departmental responsibilities. Other significant concerns that arose were uniformity in terms of data collection procedures, definitions of the STEM disciplines (e.g. agriculture, social, behavioral and economic sciences, etc.), and underrepresented racial and ethnic minorities, and program eligibility.

Some Alliance partners contended that the questionable accuracy and/or authenticity of the baseline data used to establish Phase II goals and objectives for their respective institutions resulted in allocating inadequate resources for them to be successful. High turnover rates in campus coordinator positions contributed to challenges with verification of baseline data. The lack of a designated location to serve as a central repository for LSAMP-related data proved to be another significant obstacle. By the time of the 2015 external evaluation site visit, only one partner institution had submitted a comprehensive report of their 2014-2015 activities to the interim PD. Having a full-time PD in place with immediate access to the WebAMP reporting system, would immediately enhance access to and accuracy of institutional enrollment and degree data. This, in turn, would greatly aid the external evaluators’ ability to collect high-quality data to effectively and fairly assess the performance of the Alliance on key indicators. Another concern pertained to the administrative structure. At the time of the first external evaluator’s site visit, the Vice President of Institutional Diversity (VPID) at UK assumed the primary administrative duties related to the grant. However, when the VPID decided to retire in July 2015, there was an inadequate uniform level of accountability among Co-PIs to help ensure that the grant was properly administered.

The 2014-2015 external evaluation report emphasized the urgency of hiring a full-time, experienced director. The PI did so immediately. The current PD assumed the position on October 1, 2015 (or Year 3 of Phase II). After meeting with the Leadership Team—Co-PIs, PI, and external evaluator—the PD visited each partner institution. The visits produced documented evidence of varying degrees of successful program activities; this provided the PD with an opportunity to develop a more focused strategic plan to address the most challenging aspects of the program.

Another major issue that emerged during the evaluator’s 2015 visit was the inaccuracy of the participant and enrollment data and resulting budget allocations. To address this data issue, the PD implemented a policy to receive enrollment and degree data directly from two state agencies – the Kentucky Council on Postsecondary Education and the West Virginia Higher Education Policy Commission. Beginning with the 2014-2015 academic year, this has resulted in significantly more reliable and consistent data. The Alliance initiated a data tracking system housed at the lead institution.

In 2014-15, the lead institution was also challenged in terms of its own campus program. For example, the PD inherited a program that had only three participants but essentially no LSAMP campus activities. A year later, the institution supported 17 Scholars. The under participation of Scholars in professional conferences was identified as a barrier for professional development. The Alliance began addressing this matter during the 2015-16 academic year. Since then, Scholars attended several conferences or workshops, including the following:

- 25th LSAMP Anniversary Research Symposium in Washington, D.C.
- National Conference on Undergraduate Research (NCUR) in North Carolina, Oklahoma and Tennessee
- KY-WV LSAMP Annual Research Symposium
- GEM Grad Lab
- Women of Color STEM Conferences
- Louis Stokes Midwest Center of Excellence (LSMCE) Conference
- An international REU pre-trip Conference in Washington, D.C.
- Louis Stokes Midwest Center of Excellence Conference
- Black Engineer of the Year Award Conference
- An international REU workshop in France.

The PD and Co-PIs also participated in disseminating some of the program's most promising practices. For example, three workshops were conducted at the LSMCE and LSAMP conference. One Co-PI published an article on an innovative curriculum activity.

Addressing the need to strengthen alliance communication, the PD conducts annual fall semester campus visits to each partner institution. The agenda for these visits is informed by recommendations from the external evaluator and the PD's observations regarding opportunities, individual campus needs and resources. Campus visits also include a revised orientation for faculty mentors. In terms of developing a pathway to the Alliance, a pamphlet "Why STEM?" was developed and distributed to high school students. At least one coordinator reported outreach to middle school students. The Alliance has developed a coordinator's handbook and website. Promising practices and opportunities are shared electronically with the Alliance institutions. Further, an annual Alliance retreat (1.5 days) serves as an event for communication and community building.

In 2016-17, the PD hired a graduate student assistant to coordinate the Scholars' activities at the lead institutions as well as to manage a listserv for the Alliance Scholars. In 2017, the annual research symposium was expanded to a two-day event. Day 1 serves as a networking and professional development for the Scholars; on Day 2, Scholars present their research to the public—including faculty, program staff, etc.

CONCLUSIONS

The magnitude of progress in the last three years cannot be overstated. The organizational, managerial, and structural changes are beginning to bring the partnerships closer to a functioning, comprehensive Alliance. Although there has been measurable progress, there is still a need to build on the last three years' success. The Alliance is at a critical stage that now requires each campus coordinator to take a more proactive role in advancing the program on their campus as well as working with the leadership team and other coordinators to create and implement innovative multi-campus events. In the final year of Phase II, the Alliance was successful in being awarded a grant for a third cycle of funding. Going forward, the Alliance will need to be more deliberate in assessing its goals. It will be important for the leadership team and the coordinators to remember that the Alliance operates in a dynamic environment that may require periodic revisiting of the original proposal goals and objectives. For example, in Phase II, some campus institutional contributions were negatively impacted by state budget cuts to higher education.

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APPENDIX C

COMIC REPRESENTATION OF
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18



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VOL 26 ISSUE 1

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