

Work in Progress: The University of Texas System Louis Stokes Alliance for Minority Participation: A State-wide Initiative to Promote STEM Undergraduate Research

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Abstract— For 20 years, nine institutions in the University of Texas System and five partnering community colleges have collaborated to promote STEM undergraduate research through the Louis Stokes Alliance for Minority Participation (LSAMP). The primary programmatic activity of the Alliance is its Summer Research Academy (SRA) which has engaged a total of 1,565 undergraduates. Of these, 242 have been supported within the last five years. The Alliance has also partnered with the US Department of Energy to support a number of faculty and student teams (FaST) to engage in research at several national laboratories. Since 2003, 37 students and four faculty members have participated in this effort. This paper will describe both the SRA and FaST. Data on program participation and success will be discussed. The Alliance is now posed to expand its effort to include research abroad. The general direction of the Alliance for the next five years will be discussed.

Keywords—undergraduate research; STEM; National Science Foundation

PROJECT HISTORY AND ACTIVITIES

The University of Texas (UT) System Louis Stokes Alliance for Minority Participation (LSAMP) became a coordinated effort in 1992 with leadership that consisted of presidents and provosts from the entire UT System. The objective of the first phase was to increase the number of STEM undergraduate degrees that were awarded to underrepresented minority (URM) students. Phase II focused on increasing the number of community college students transferring to four-year universities in the STEM disciplines; the initiative to increase BS production continued. Phase III saw a shift in objectives when the primary goal became an increase in the number of students entering into STEM MS or Ph.D. programs following receipt of their undergraduate degree. Phase IV was incepted in 2007 and the focus continued to be graduate degree promotion but was expanded to include international travel/research experiences.

The primary activity of the UT System LSAMP is the annual Summer Research Academy (SRA). The SRA is an

eight-week program in which undergraduate STEM majors work on an intensive research project with a tenured or tenure-track faculty member at one of the nine UT System campuses. The SRA is intended to be an exchange program in which the students have the opportunity to engage in research outside of their home institution to preview another UT System campus's programs and environment. The participating students work as part of a research team under their faculty mentor's supervision on a cutting-edge STEM project. Students at each of the campuses also participate in a series of developmental workshops, videoconferences, laboratory trainings, and other meetings to enhance their research experience. They learn how to create conference-style research posters and present their work locally at the end of each SRA. The annual UT System LSAMP Student Research Conference, held in the fall semester gives the SRA students the opportunity to gain more presentation experience and to share their research findings with a national audience.

Since undergraduate research is the proven method of the UT System LSAMP to increase minority student graduation, we have partnered with the Department of Energy to offer faculty and students from our partner campuses the opportunity to participate in the Visiting Faculty Program (VFP), formerly the Faculty and Student Teams (FaST) initiative, at one of the US National Laboratories. As part of VFP, each faculty member will lead a team of 2-4 undergraduate and/or graduate students at a national laboratory. The team will work on-site at the national laboratory as part of a larger research group on an established project. The team will be hosted and mentored by a research scientist housed at the lab and will perform their specific research for 10 weeks. In the past, the UT LSAMP has sent teams to Argonne National Laboratory, Lawrence Berkeley National Laboratory, Pacific Northwest National Laboratory, and most recently, Oak Ridge National Laboratory. The teams may originate from any campus in the UT System and the lead institution (UT El Paso) submits a NSF proposal on their behalf to secure the funding and manage the grant.

PROGRAM SUCCESS

For almost 20 years, the UT LSAMP has been one of the premiere research programs for undergraduate students in the UT System. Over 1,500 STEM students have conducted meaningful research as participants in the SRA and have developed professional skills through the various activities offered as part of the SRA experience. Project goals have been met and exceeded during the duration of the grant.

Since its inception, the UT System LSAMP has tracked enrollment of and degrees awarded to URMs in STEM disciplines by partner institutions. The results achieved to date are extremely encouraging. Enrollment has grown steadily from 8,367 in Fall 1991 to 17,593 in Fall 2009. This is an increase of 110% with respect to 1991 LSAMP baseline data. Similarly, the number of baccalaureate degrees awarded annually to underrepresented minorities in STEM disciplines has increased from 575 in AY 1992-1993 to 2,004 in AY 2009-2010. The rise is an unprecedented increase of 351%. This increase in degree production has consistently placed four institutions in the Alliance among the Top 10 in the nation for awarding undergraduate degrees to Hispanics in Engineering, Education, Nursing, and Business to name a few. In 2009, STEM fields accounted for 22.1% of UT System degrees awarded as compared to the national public university average of 18.4%.

A large range of STEM majors is represented by SRA alumni with the most common being Biology (21%), Electrical Engineering (10%), Computer Science (9%), Mechanical Engineering (9%), Chemistry (8%), and Mathematics (8%). The majority of students in the VFP have been from various engineering fields and chemistry.

LSAMP'S FUTURE

In October 2011, the UT LSAMP submitted a fifth proposal to the NSF for funding as a Model Senior Alliance to conclude the work it has done for 20 years. This proposal will continue best practices and will address three primary objectives: 1) enhancing the UT System SRA to ensure that a significant number of students, including veteran students, participate in a sequence of research experiences, starting with on-campus training and culminating with a UT System summer undergraduate research exchange, a national laboratory opportunity, or a research abroad capstone experience; 2) ensuring that URM students who are co-enrolled in partnering community colleges and universities complete their STEM associate degrees and advance towards their baccalaureate degrees; and 3) creating synergy among closely related NSF-funded projects-e.g. S-STEM, STEP, REU, and AGEP- at each one of the Alliance's partnering institutions to create pathways to success for URM STEM students. The proposal also included the addition of two community colleges to the Alliance: Tarrant County Community College District and Tyler Junior College.

The Alliance's plan for the next five years, which is derived from an analysis that looks at internal strengths and weaknesses and external opportunities and threats, is to provide STEM students continued opportunities to perform research at UT System universities, the US Department of Energy's national laboratories, and various international research sites.

CONCLUSION

Based on NSF's goal to diversify the STEM workforce and include more URMs in academia, the UT LSAMP's mission is more important than ever before. The global research community continues to grow and the demand for competent undergraduate and graduate students will continue to increase in the United States. The UT LSAMP is in the unique position to make a positive change for URM involvement at the undergraduate and graduate research level. The UT LSAMP's work to improve the number of URMs graduating with STEM degrees and continuing on to graduate school is also directly in line with the Texas Higher Education Coordination Board's "Closing the Gaps" initiative. This plan includes four focus areas: 1) student participation in higher education, 2) student success in college, 3) excellence in teaching, and 4) high quality research and scholarship. Because of this, the UT System LSAMP will help insure that talented students from diverse backgrounds will have the support necessary to earn bachelor's and, ultimately, doctoral degrees in a timely fashion and become future leaders in STEM disciplines both in Texas and across the nation.

REFERENCES

[1] UT El Paso, UT System LSAMP Program, "UT System Louis Stokes Alliance for Minority Participation 20th Year Impact Report, 1992-2012", <http://lsamp.utep.edu>.

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