Kentucky – West Virginia Alliance for Minority Participation

Project Summary

West Virginia and Kentucky have formed an Alliance for Minority Participation in science post-secondary, education.

More than $2.5 million will be shared among institutions of higher education over the next five years

The National Science Foundation is providing federal funds, the first of this type in either state

WVU, MU, WVSU and WVSCTC will participate as the initial institutions in the alliance representing West Virginia along with six institutions in Kentucky

Program's primary goal will be to more than double the number of minority graduates in science, technology, engineering, and math (STEM) fields over five years

Additional institutions may participate in the program, and federal funds may increase accordingly, in future years

Presidents of each institution along with the Higher Education Policy Commission Chancellor will oversee the program and coordinate inter-state and inter-institutional activities

The National Science Foundation (NSF)

The NSF is an independent federal agency created by Congress in 1950. Unique among federal agencies, it is responsible for the overall health of science, technology, engineering, and mathematics (STEM) research across all disciplines and ensures the Nation's supply of scientists, engineers, and science educators for future generations. With a $5 billion budget, the agency disburses funds to colleges and universities, k-12 school systems and other partners through grants and agreements. NSF accounts for about one-fourth of all federal support to academic institutions for basic research in the United States.

Louis Stokes Alliance for Minority Participation (LSAMP)---A NSF Grant Program

The Louis Stokes Alliances for Minority Participation (LSAMP) program is designed to develop strategies to strengthen preparation and increase the number of minority students who complete baccalaureate degrees in STEM fields. Each LSAMP grant (award) requires the awardee to establish meaningful partnerships among academic institutions and encourages the inclusion of government labs, industry, and professional organizations. Institutional partners in the alliance may tailor activities that provide student enrichment within the regional, state, or local setting. NSF considers increasing the participation of minorities and women in science a national priority.

The Kentucky-West Virginia Alliance for Minority Participation

For more than two years, education leaders in Kentucky and West Virginia have been meeting to discuss a collaboration of institutions that could successfully design, compete for, and implement a LSAMP program. Both WVEPSCoR and KYEPSCoR program offices within the Higher Education Systems of each state, sponsored discussions that would increase STEM student diversity and representation of minorities in science disciplines. Recognizing that cultural issues may inadvertently discourage bright students for entering STEM fields and, that relatively few minority faculty mentors were available to encourage students, the two states joined forces to rectify this problem. The relatively low populations in each state gave further impetus to forge the alliance and achieve a critical mass of students required to apply to the LSAMP program.

Alliance Partners and Key Personnel

The KY – WV LSAMP alliance is a collaboration of ten academic institutions, the KY-NSF Experimental Program to Stimulate Competitive Research (EPSCoR), the WV-NSF EPSCoR, two state agencies, and the initial stage of a developing industrial support base.

The partnership institutions are: Bluegrass Community & Technical College, Lexington, KY; Centre College, Danville, KY; Kentucky State University, Frankfort, KY; Marshall University, Huntington, WV;

University of Kentucky, Lexington, KY; University of Louisville, Louisville, KY; Western Kentucky University, Bowling Green, KY; West Virginia State Community & Technical College, Institute, WV; West Virginia State University, Institute, WV and West Virginia University, Morgantown, WV. Each institution has a unique mission and character, and serves a distinct population. To maximize the strengths and contributions of each Alliance partner, the development of best practices for each Alliance focus area described in the previous section will be housed among the various institutions. The LSAMP Central office will assist with the coordination and dissemination efforts among the partners, as well as sponsor Alliance activities such as workshops and seminars that address these focus areas.

Alliance Background and Rationale

Increasing both the total number of STEM degrees awarded, and the number of STEM degrees awarded to underrepresented students, are priorities in both West Virginia and Kentucky. According to the National Science Board Science and Engineering Indicators 2004, West Virginia fell in the 3rd quartile and Kentucky fell in the 4th quartile for natural science and engineering bachelor's degrees conferred per 1,000 18–24-year-olds in 2000. Furthermore, both states fell in the 4th quartile for science and engineering degrees as a share of higher education degrees conferred in 2000. The two states represented in the Alliance have a relatively small minority population. The 2000 Census reported that over 25% of the U.S. population was African-American, Hispanic or Native American. These same minority groups made up only 9% and 4.1% of the population in Kentucky and West Virginia respectively. These numbers represent a recruitment challenge for the Alliance but have also served to strengthen the resolve of the participating institutions. The ten institutional partners submit this Phase I proposal to significantly increase the quality and quantity of underrepresented students receiving baccalaureate degrees in STEM fields, and enhance their research career aspirations. Table 1 contains baseline statistics for enrollment and graduation for the partner institutions. These values represent 5-year averages where available to more accurately establish appropriate baseline values. The values reported for minority populations in this proposal consist of African Americans, Hispanics, and Native Americans.

Table 1: Undergraduate Student Population

KY-WV LSAMP Four-Year Institutions			Total Campus						STEM ONLY*					
			Enrollment			Degrees			Enrollment			Degrees		
			Minority		(Total)	Minority		(Total)	Minority		(Total)	Minority		(Total)
			#	%	#	#	%	#	#	%	#	#	%	#
KY	1	U. of Kentucky	1,608	6%	25,438	278	5%	5,078	190	4%	4,602	24	3%	865
	2	Kentucky St.	1,527	70%	2,171	209	65%	320	250	74%	337	36	78%	46
	3	U. of Louisville	2,172	15%	14,548	438	11%	3,829	313	12%	2,698	24	8%	290
	4	Western KY U.	1,395	9%	14,856	173	6%	2,921	89	5%	1,869	10	4%	229
	5	Centre	66	6%	1,062	15	6%	242	8	8%	106	3	6%	53
WV	6	West Virginia U.	1,354	7%	18,653	210	7%	3,157	142	4%	3,791	22	3%	712
	7	Marshall U.	533	5%	9,799	74	5%	1,479	45	4%	1,105	6	4%	148
	8	West Virginia St.	614	18%	3,319	84	19%	438	60	20%	303	3	13%	24
Totals & Avg. %			**9,269**	**10%**	**89,846**	**1,481**	**8%**	**17,464**	**1,097**	**7%**	**14,811**	**128**	**5%**	**2,367**

The Alliance includes, directly and indirectly, local community and technical colleges in the two states. These institutions have a priceless resource—a large population of underrepresented STEM students with the potential to transfer to a 4-year STEM program at one of the alliance institutions. Three community and technical colleges in particular have had a strong involvement in the development of the alliance activities—Jefferson Community College (Louisville, KY); Bluegrass Community and Technical College (Lexington, KY); and West Virginia State Community and Technical College (Institute, WV). Jefferson Community College figures prominently in the recruitment activities of the University of Louisville. Most recent numbers indicate that these institutions had 18, 45, and 47 underrepresented

Alliance Activities and Goals

students enrolled in STEM fields in addition to the hundreds of students still undecided on an area of study. These students represent a largely untapped resource and an opportunity to improve and supplement the LSAMP cohort.

The Alliance institutions have established an aggressive goal for the baccalaureate degree production expected at the end of the 5-year Phase I proposal. Table 2 illustrates the anticipated degree production. We believe that the approach outline below will allow us to reach these targets.

Table 2: KY-WV LSAMP Alliance Degree Goals

KY-WV LSAMP Four-Year Institutions			Current Degrees	5-Year Target	% Increase
KY	1	U. of Kentucky	24	50	108%
	2	Kentucky St.	36	72	100%
	3	U. of Louisville	24	50	108%
	4	Western KY U.	10	20	100%
	5	Centre	3	9	200%
WV	6	West Virginia U.	22	45	105%
	7	Marshall U.	6	15	150%
	8	West Virginia St.	3	9	200%
Totals			128	270	111%

A recent WESTAT study sponsored by NSF examined several federal programs designed to address this issue and found that the Louis Stokes Alliances for Minority Participation (LSAMP) has had a huge impact on the nation's URM STEM baccalaureate production. LSAMP projects shared six characteristics that appeared to be responsible for their success: summer bridge, research experience, mentoring, drop-in center, caring staff and alliance structure.

The partners of the KY – WV LSAMP submit this Phase I LSAMP proposal to realizing the goal of creating diverse campus environments and increasing minority STEM baccalaureate degree production. The developed approach incorporates those six identified characteristics of successful programs in a manner tailored for the Alliance institutions and the two states. The focus areas for our approach are:

Recruitment and retention
Research experiences
Transitional experiences
Climate
Curriculum reform
Postgraduate career aspirations
Role models

Recruitment and retention efforts across the Alliance will be enhanced by a best-practices committee of partner institutions. This working group is directed by the University of Louisville (UofL) and Centre College. It will examine such novel activities as the "College Reality Stores" developed by Kentucky State University (KSU) which will serve as awareness program for students and their parents from the middle and high school levels. Recruitment and retention activities are key components of the program for each institution.

Five of the Alliance institutions with significant undergraduate research components will address best practice issues for Research Experiences. These institutions, KSU, Marshall University (MU), the University of Kentucky (UK), the UofL, and West Virginia University (WVU) will play a significant role in the development of the annual student symposium, potential workshops, and promotion of the 16 Alliance

summer research scholarships funded through the state NSF EPSCoR offices.

Transitional Experiences activities include bridge programs for incoming freshman and students transferring from community colleges. These activities and related practices will be critical to addressing the pipeline issues. KSU, Centre, WVU, MU, West Virginia State University (WVSU) and West Virginia State Community & Technical College (WVSCTC) have all incorporated bridge programs into their strategies for achieving the growth in STEM baccalaureate degree production. Western Kentucky University (WKU) is developing a guidebook for incoming freshman students. The lead institutions for best practices in transitional experiences are BCTC, MU, WVSU and WVSCTC.

Issues of campus climate have long been identified as problematic areas for minority students. These issues are closely related to matters of retention. Drop-in centers have been identified as a possible solution to these issues. Other solutions include such practices as peer mentoring/counseling, block scheduling, living/learning communities. BCTC, MU, UK, UofL, WKU, WVSTC, WVSU, and WVU have each incorporated one or more of these solutions into their proposed activities. Best practices in issues of campus climate will be handled by BCTC and WKU.

Curriculum reform is perhaps the least costly and most challenging of the identified focus areas. It is an unfortunate reality that training in instructional methods and curriculum development are rarely incorporated into doctoral programs, and rarely found in new faculty orientations. Additionally, academic bureaucracy and issues of class ownership further complicate this problem. Clarification of student learning goals and their alignment with course assessments will enhance the success rates for all students. The Alliance institutions are committed to addressing this concern particularly as it relates to the traditional ~~g~~atekeepingll courses in areas like mathematics. WVU has created the Institute for Mathematics Learning (IML) to address student success in first and second year undergraduate mathematics courses. Mathematics courses have been restructured based on the Triesman model of building community through mentoring and challenging students in the subject area. Respecting diversity is also important in the development and selection of curriculum materials. Best practices in the area of curriculum reform for the Alliance will be led by UK, WVU and WKU.

Enhancing postgraduate career aspirations and improving the visibility of role models for our students are both issues that are of keen interest to all Alliance partners. The Alliance will sponsor workshops on the benefits of graduate school, preparation for graduate school, and research career options. Seymour and Hewitt documented the importance of role models for students in science and engineering disciplines. Table 3 indicates the current state of faculty role models at the partner institutions. It is apparent that the low numbers of role models available for our students pose a challenge for the Alliance.

Table 3: Alliance Faculty Representation

KY-WV LSAMP Four-Year Institutions			Total Full-time Faculty (FTF)		Total Underrepresented FTF	Total STEM FTF		Total Underrepresented STEM FTF
			#	%	#	#	%	#
KY	1	U. of Kentucky	1,917	4.5%	87	348	2.6%	9
	2	Kentucky St.	151	4.6%	7	19	36.8%	7
	3	U. of Louisville	1,349	20.0%	270	169	5.3%	9
	4	Western KY U.	682	5.1%	35	166	3.6%	6
	5	Centre	118	4.2%	5	36	8.3%	3
WV	6	West Virginia U.	1,319	11.0%	145	335	2.7%	9
	7	Marshall U.	492	6.9%	34	111	1.8%	2
	8	West Virginia St.	203	6.9%	14	31	22.6%	7
Totals and Avg. %			**6,231**	**9.6%**	**597**	**1,215**	**4.3%**	**52**

Each partner institution is committed to increasing recruitment efforts and developing effective retention strategies for minority STEM faculty. Howard Adams, former Executive Director of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM) is a leading expert on effective strategies for professional, educational and personal development. His workshops

and seminars on these two final focus areas have been widely received at over 500 colleges and universities, and numerous national conferences. Adams has been consulted regarding the workshop and seminar needs in these areas, and appropriate arrangements will be made for Alliance-wide workshops addressing related topics.

In addition to the workshops and seminars described above, the Alliance will sponsor an annual LSAMP Student Symposium that will provide students with an opportunity to give scholarly presentations, network with faculty and students from Alliance institutions, and participate in Alliance workshops and seminars. In furtherance of the recruitment and retention efforts, the Alliance will help sponsor and coordinate regional workshops for teachers and school counselors to increase the profile of the program in the community-at-large.

The potential impact of this program will be visible on both campus and state levels. The *intellectual merit* of the proposed activity is the increased knowledge base related to teaching and learning practices for STEM disciplines, the knowledge base regarding practices for improved retention, and the development of improved curriculum materials and practices for STEM disciplines. The foremost *broader impact* is the increase in minority STEM baccalaureate degree production. This will broaden the math, science, and engineering participation of underrepresented students in two states. The increase in skilled workforce has the potential to significantly stimulate the competitive position of the two states relative to that available with the current educational levels, and in doing so, attract new jobs which diversify the economic base. Improvements in the faculty demographics add expanded research capacity to academic community and broaden the participation of underrepresented faculty in STEM disciplines.