

# OKLAHOMA LOUIS STOKES AMP

*Oklahoma Louis Stokes Alliance for Minority Participation in Science ↔  
Technology ↔ Engineering ↔ Mathematics*



## **2004 Report for Performance Effectiveness Review**

**To  
Division of Education and Human Resource Development  
Alliances for Minority Participation**

**at  
NATIONAL SCIENCE FOUNDATION  
ARLINGTON, VIRGINIA**

**11 November 2004**

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**Oklahoma Alliance for Minority Participation  
"PERFORMANCE EFFECTIVENESS" REVIEW (P.E.R.)**

**November 11, 2004**

**The National Science Foundation**

**4201 Wilson Blvd. ROOM 815**

**Arlington, VA 22230**

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## PERFORMANCE EFFECTIVENESS REVIEW

### INTRODUCTION

Over the past academic year, the Oklahoma LSAMP program made continued progress in its commitment to implement programs and strategies to enhance diversity among the nation's supply of educators and researchers in Science, Technology, Engineering, and Mathematics (STEM). Toward this end, the program has continued to identify students with high achievement potential, and has impacted academic success and retention through programs and activities that provide a community of support.

Ten (10) institutions comprise the Oklahoma Alliance. These are: *Cameron University, East Central University, Langston University, Northwestern Oklahoma State University, Southeastern Oklahoma State University, Southwestern Oklahoma State University, University of Central Oklahoma, University of Oklahoma, and University of Tulsa*. Inclusive in this partnership are 1) Oklahoma's three research universities - *Oklahoma State, University of Oklahoma, and University of Tulsa*; 2) the state's only Historically Black College/University – *Langston University*; 3) one metropolitan urban institution - *University of Central Oklahoma*; and 4) five regional universities of the state system. The remaining 18 accredited college and universities are eligible to participate as Affiliates Institutions.

The Oklahoma Alliance has impacted student achievement for ten consecutive years. At the onset of Phase II in 1999, the baseline number for underrepresented STEM graduates was 438. This was an increase of more than 100% over the initial baseline of 214 in 1994. Many factors underlie the overall success of the Oklahoma program. These include:

- Participation and supplemental financial support from the Oklahoma State Regents
- Faculty, staff, and graduate student participation
- Frequent meetings with scholars
- Academic support
- Career counseling
- Organized programs (Research Internship Program, Summer Bridge Programs, Research Mentoring Program)
- Availability of program staff

### STUDENT ACHIEVEMENTS 2004-2005

- 1) An impressive numbers of OK-LSAMP students received awards and recognitions for academic and other accomplishments and involvements. These include:
  - Induction of 9 scholars into *Native American, African American, Hispanic, and Asian American Chapters of Science and Engineering Societies*;

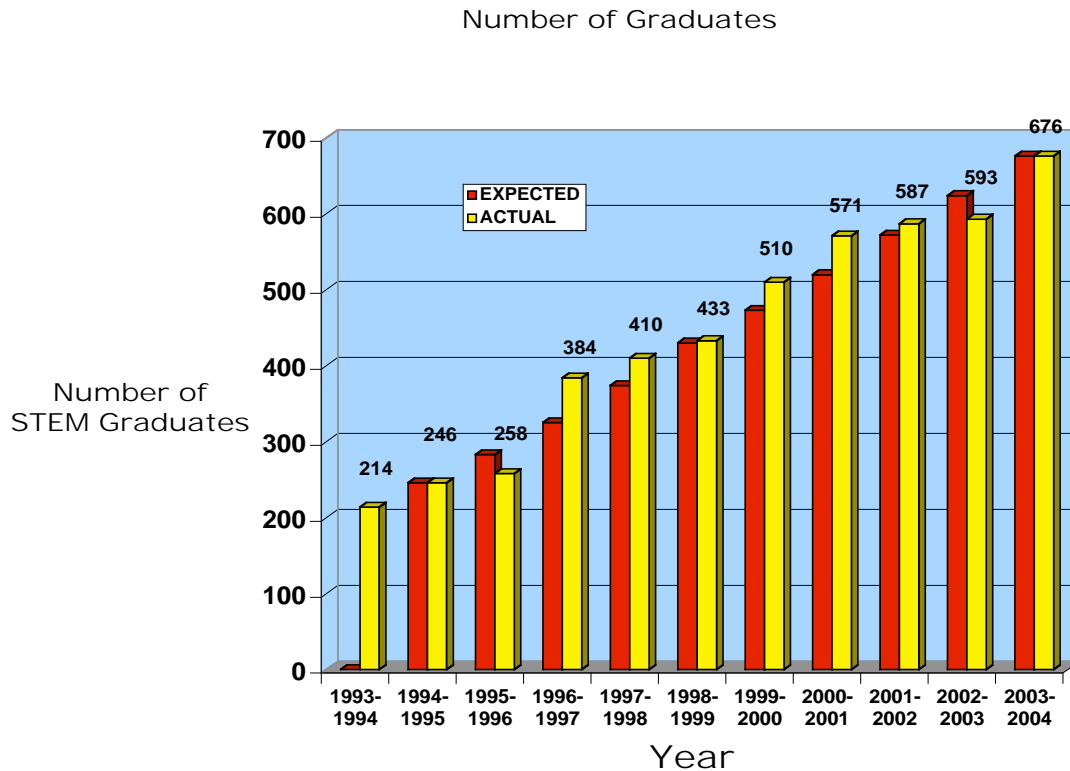
- Two (2) were ranked among the campus' TOP 20 (based on grade point average, leadership, campus activities, and honors);
  - Two (2) scholars were among 18 national recipients of a scholarship from the National Society of Physics Students;
  - Two (2) scholars received 'Best Undergraduate Oral Presentation' and 'Best Undergraduate Poster' at the 92<sup>nd</sup> Annual Meeting of the Oklahoma Academy of Science meeting, and another scholar won Overall First Place at Fall '03 Annual Oklahoma Research Day;
  - Scholar was elected Headman of the Native American Brotherhood at the University of Oklahoma; and
  - A number of scholars received Awards of Excellence and were inducted into various Honor Societies
- 2) *Conferences in which students made presentations:* University of TX LSAMP Annual Symposium, National Science Teachers Association, National Meeting of the Association of Physics Teachers, Society of Neuroscience, Annual Student Research Conference at West Texas A&M, Colorado McNair Conference, National Conference for Undergraduate Research, Regional meeting of the Society of Physics Students, Annual Joint Meeting of Beta Kappa Chi/National Institute of Science/Brookhaven Semester Program, Annual meeting of the Southwestern Association of Naturalists, Annual Meeting of the Oklahoma Chapter of the American Fisheries Society, Annual OK-LSAMP Research Symposium.
- 3) *Student Included in Publications:* Oklahoma State University senior, *Marty Heppler*, has worked in the laboratory of Dr. Jeanmarie Verchot-Lubicz, Associate Professor, Entomology and Plant Pathology for two years, and is included in the following publications: a) Howard, A.R., **Heppler, M.**, Payton, M.E., Ding, B., Verchot-Lubicz, J. (2004). *The Potato virus XTGBp1 is the primary factor that can move from cell to cell and induce plasmodesmata gating in several plant species.* Virology, in press; and b) Krishnamurthy, K., Mitra, R., **Heppler, M.**, Payton, M.E., and Verchot-Lubicz, J. (2003). *The Potato virus XTGBp3 protein associates with endoplasmic reticulum for virus cell-to-cell*

### ALLIANCE ACCOMPLISHMENTS

During the 2003-2004 academic year, the Oklahoma AMP supported 192 scholars, including one affiliate scholar from Oklahoma Christian University. The amount of stipends ranged from \$500 to \$2,500 per semester.

Specific Phase II goals were aimed at:

- 1) *Increasing by 15% annually the number of baccalaureate degree recipients in STEM disciplines;*
- 2) *Preparing participants for entry into graduate programs; and*
- 3) *Increasing the number of graduate school enrollees.*

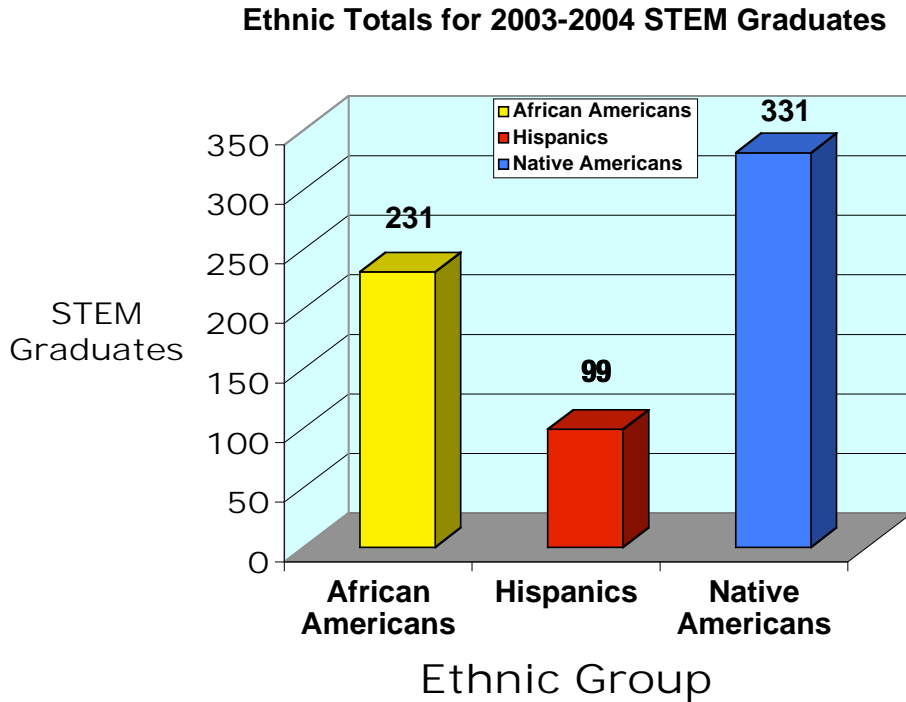


**Table 1. Number of graduates for Phase II and I.**

Table 1 shows the progression of our growth in STEM graduates. As we projected from the beginning of the OK-LSAMP program we have grown from 214 in 1994 to 676 in 2004. This has been consistent with our original projections. The 676 STEM graduates now establish an excellent baseline for a critical mass of graduate students. The bridge to doctorate program is very appropriate for us.

In seeking to attract and retain students from Native American, African American, Hispanic, and Native Pacific Islander populations, Phase II objectives emphasized five (5) major areas:

- 1) *Intense recruiting* from populations underrepresented in STEM graduate programs and the STEM workforce;
- 2) *Expanded retention efforts* through programs and services that focused heavily on mentoring, tutoring, and social/emotional support;
- 3) *Year-round research involvement* with a faculty mentor;
- 4) *Greater participation in professional meetings* at the local, state, regional, and national levels; and
- 5) Development and implementation of a detailed *graduate school preparation program*.



**Table 2. Ethnic Distribution on 2004 STEM graduates:** Oklahoma continues to lead the nation in the number of Native American graduates receiving B.S degrees in STEM fields. In addition, Oklahoma Universities lead the nation in graduating Native Americans with PhD degrees. However, the number of Native Americans receiving PhD degrees in STEM areas still remains well below the B.S. degree parity.

### **Recruitment Efforts**

Practically every known recruitment strategy has been utilized over the duration of the program. During the past year, greater than usual emphasis was placed on one-on-one contacts that included recommendations by matriculating scholars as well as former participants. Summations of recruitment efforts are as follows:

- 1) Dissemination of program information to high school administrators and teachers; tribal educational offices; civic, religious and social organizations; organized programs such as AISES (American Indian Science and Engineering Society); community colleges; community leaders and other individuals, as well former participants.
- 2) Collaboration with community college faculty and staff - including Seminole State College, Eastern Oklahoma State College, Oklahoma City Community College, and Tulsa Community College.
- 3) Collaboration with other campus programs such as High School and College Relations, Enrollment and Financial Aid, Multicultural Engineering Programs, Multicultural Student Services, and various student organizations.
- 4) Participation in recruitment fairs

**Retention Interventions**

- 1) Accessibility of program staff to students. At the Lead Institution (Oklahoma State), the program has a full time staff. On partner campuses, most coordinators are full time faculty, and are assisted by part-time staff and volunteers.
- 2) Maintenance of a friendly, helpful, and professional environment that projects a non-intimidating atmosphere, has a caring staff, encourages informal interactions, provides support and a sense of community, and helps new students, in particular, feels comfortable with their decision to attend college.
- 3) Weekly meetings of Cadre groups (freshmen and sophomores), and monthly or other regularly scheduled meetings with all participants (freshmen through seniors) that promote interaction with peers as well as with faculty and staff from STEM departments and other academic and support areas.
- 4) Selection of a pool of carefully selected, highly qualified tutors who provide academic help to individuals and groups.
- 5) Frequently scheduled academic, skill building, and personal enhancement workshops that relate to time management, study skills and strategies, selecting a major, selecting a mentor, financial management, campus support services, opportunities for training and additional financial assistance (i.e. scholarships, fellowships, internships); faculty and staff make presentations pertinent to specific research involvements and professional development, and former OK-LSAMP participants - either in the workforce or pursuing graduate studies - are periodically invited to give pep talks and share experiences.
- 6) Evaluation of feedback from faculty research mentors.
- 7) Provision of opportunities for interaction with graduate students - as Graduate Liaisons and/or as presenters at scheduled meetings

**OK-LSAMP-SUPPORTED ACTIVITIES****Expansion of Research and Presentation Experiences**

*Many opportunities were provided for research training and experiential learning, including opportunities to attend and present posters and papers at local, regional, and national conferences.*

- 1) During fall and spring semesters, scholars at the sophomore, junior and senior levels were required to participate in the *Mentoring Component* of the program. The student, upon acceptance by a faculty mentor, began his/her initial research training and participation in research projects.
- 2) During each summer term, the program provided opportunities for scholars to expand their research training through the Research Internship Program (RIP). Stipends were offered in the amount of \$3,000.00 for eight weeks. In addition, scholars were strongly encouraged to participate in REU's (Research Experiences for Undergraduates) or similar programs at other institutions, and apply for internships at corporations, national laboratories, and federal agencies.
- 3) During summer 2004, more than 40 scholars were engaged in research programs at Oklahoma institutions and other research facilities, (REU's at other campuses, and various local and federal agencies).
- 4) Scholars participated in more than 20 local, regional, and national conferences.

**Graduate School Preparation**

*Focal points on graduate school preparation included: participation in the Graduate Preparation component of the program, interaction with matriculating graduate students, the Graduate Record Examination (or other appropriate exam), the application process, and research experiences.*

- 1) Throughout Phase II, regular meetings were scheduled for juniors and seniors with even a remote interest in graduate training. Spearheaded by the Lead Institution, interactive presentations were provided by the Oklahoma State University Graduate College as well as faculty, staff, and graduate students from the various STEM departments.
- 2) A series of Graduate Record Examination Preparation modules were developed that provide learning activities that will assist students in acquiring knowledge, practicing skills, and completing steps necessary to gain admission to graduate school with successful completion. *The modules focus on: a) what is the GRE, why it should be taken, how to prepare, contents and format, b) cost, c) where and when to take the GRE, d) test-taking skills relevant to computer aided test format e) practice tests, f) scoring and g) average score requirements for specific fields of study.*

**‘VALUE ADDED’ FOR INTER AND INTRA-INSTITUTIONAL  
PROGRAMMING AND COHERENCE**

1. **Graduate Prep modules**, developed by Oklahoma State University, were shared with all partner institutions. The information benefits not only OKAMP students, but other students as well who are considering graduate study. These modules encompass, to some degree, implementations by partner institutions that provide guidance and encouragement for students to take the general part of the GRE at the beginning of the junior year and the advanced part in the early senior year. Modules contain detailed information on preparation for the Graduate Record Examination and other relevant exams, such as GMAT, depending on STEM discipline.
2. **Alliance meetings** - held in September, November, February, and April - allow for information exchange and discussion relative to overall program operation and specific implementations on each campus. Periodically, fiscal affairs personnel from alliance institutions attend meetings to ensure compliance with NSF requirements.
3. The **Oklahoma State Regents for Higher Education** provided funding to enhance the Residential Summer Bridge Programs at Alliance Institutions. These funds increased the number of participants supported and made possible additional enrichment activities.
4. Some alliance partners implemented in their scholars program modifications of the *Ethics and Professional Behavior* course that University of Tulsa developed for summer bridge students.
5. **National Science Foundation** funds have been - and continue to be utilized - to enhance realization of educational goals, provide tutoring as



needed, host research symposia, fund conference participation, print and disseminate program information, engage adequate staff, and fund participation in annual LSAMP meetings.

6. The **Annual Research Symposium** provides an opportunity for professional and social interaction of the entire alliance. In September 2004, more than 100 students, faculty, staff, and visitors were in attendance at the *OK-LSAMP Tenth Annual Research Symposium* held at Oklahoma State University.

### COLLABORATIONS

**Oklahoma EPSCoR**, (Experimental Program to Stimulate Competitive Research), in its efforts to provide opportunities for high achieving minority students, funded two LSAMP 8-week summer internships in the amount of \$5,000 each that placed scholars with EPSCoR Functional Genomics Scientists. In the spring semesters of 2004, EPSCoR provided 100% funding for a total of 7 students and chaperones to participate in the National Conference for Undergraduate Research (NCUR) held in Indianapolis, IN. Two students made presentations. In addition, free registration was provided for scholars participating in the annual EPSCoR *Women in Science* Conference.

### ALLIANCE OBSTACLES

- *A major obstacle is the decline in the state budget that prevented us from completing the institutionalization of the Summer Bridge program and also meeting some of the Cost Sharing supported by the Oklahoma state Regents as matching to our partner institutions.*
- *A second obstacle is the lack of sophistication and difficult management within the partner institutions in sending in vouchers in a timely manner to provide support to students.*
- *A third is the financial sacrifice that many engineering graduates feel they make by entering graduate school rather than the workforce at an attractive entry-level salary.*
- *And a fourth is the high interest in non-STEM disciplines. While the alliance has retained an impressive number of outstanding students, a considerable number make the choice to change majors, or continue in the chosen major with a career focus in the health sciences. It is deeply engrained in some cultures that a successful career means being a 'lawyer or doctor.'*

## PROGRAM EVALUATION

(Submitted by: Rosemary Hayes, NSF LS-OKAMP Program Evaluator)  
The University of Oklahoma,

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Examination of LS-OKAMP Retention and Graduation Rates

*In August 2004, C-IDEA published the fifth annual national STEM retention study, 2003-04 STEM Retention Report. This report was based on data collected from 204 colleges and universities, including all nine of the LS-OKAMP public universities. The retention data for eight of the nine institutions was provided by Assistant Director of State System Research Laura Tyree at the Office of the Oklahoma State Regents for Higher Education. The data for Oklahoma State University was provided directly from its Institutional Research Office. The University of Tulsa is not included in the report of retention and graduation rates.*

*The STEM survey focused on retention and graduation data for freshman cohorts from 1996 through 2002. The following report is based on a subset of data obtained for the nine Oklahoma public institutions.*

*The executive summary information below addresses the issues related to gender and the status of underrepresented STEM students. It also includes observations on the status of STEM retention and graduation at the LS-OKAMP institutions as compared to the overall status of STEM retention observed in the 2003-04 STEM survey of 204 higher education institutions. Unless otherwise noted, the rates in the following section are the overall rates for the period 1996-2002.*

### Demographics

During the survey period 1996-2002, underrepresented minority students (URM) comprised 19.2% of the first-time, full-time enrollments at LS-OKAMP institutions as compared to 19.4% of the enrollments across all of the 204 STEM survey institutions. Among STEM survey institutions, Hispanics accounted for 7.7% of the freshman enrollments during this period, and American Indian students accounted for 1.0%. In contrast, Hispanic students accounted for 2.9% of the freshman enrollments while American Indian students accounted for 9.1% of the freshman enrollments in the LS-OKAMP institutions.

Looking specifically at the enrollment of freshman STEM majors, one finds that a higher percentage of underrepresented minority students (21.2%) made up the freshman STEM cohorts at LS-OKAMP institutions than made up the freshman STEM cohorts at the STEM survey institutions (18.7%). It is interesting to note that at LS-OKAMP institutions, the percentage of URM students enrolling in STEM fields was greater than their percentage of representation in the general population of all first-time freshmen.

Women comprised a majority (53.2-54.3%) of the first-time, full-time freshman cohorts of both the LS-OKAMP institutions and the STEM survey institutions. However, women made up between 37.1-37.5% of the freshman cohorts who intended to major in a STEM field at both LS-OKAMP and the STEM survey institutions.

### Continuation Rates

In studying the retention and graduation rates of STEM majors we looked at two issues, the percent of beginning STEM majors who graduated from the institution in any field (any major) and the percent of beginning STEM majors who actually graduated in STEM fields (STEM majors). This information provides insight into the frequency with which STEM majors change majors and/or leave the institution. On the whole, the 2<sup>nd</sup> year continuation rates were higher for URM students at the STEM survey institutions than at the LS-OKAMP institutions. The overall 2<sup>nd</sup> year continuation rate for the 1996-2002 URM cohorts starting in STEM and graduating in any field was 76.8% within the STEM survey institutions and 74.4% within the LS-OKAMP institutions. Looking at URM students who began as STEM majors and continued in STEM, the 2<sup>nd</sup> year continuation rate was 64.7% and 54.7% respectively.

The 2<sup>nd</sup> year continuation rates for URM students in LS-OKAMP institutions, within any major and within STEM majors only, decreased from 1996-2002. In 1996, the overall 2<sup>nd</sup> year continuation rate for URM students who began in STEM and continued in any field at their institution was 75.7%. By 2002 the rate had dropped to 70.1%. Likewise, the 1996 continued to 2<sup>nd</sup> year continuation rate for URM students who began as STEM majors and continued as STEM majors was 55.6%. By 2002 the rate was 53.6%. This is in contrast with relatively stable continuation rates for URM students during the same period in the STEM survey institutions.

In the STEM survey institutions we find that 82.4% of freshman women who began in the STEM fields continued on to the 2<sup>nd</sup> year at their institution; and 65.9% of the initial class of female freshman STEM majors continued at their institutions and were still in STEM majors. As was seen with the URM students in the LS-OKAMP institutions, the 2<sup>nd</sup> year continuation rates both within the institution and within the STEM field were lower than the STEM survey institutions, 77.9% and 54.9% respectively.

### Graduation Rates

*Those URM students who began as STEM majors and stayed enrolled at LS-OKAMP institutions graduated within five years and six years within STEM fields at a slightly higher rate than URM students enrolled in the STEM survey institutions. The six-year within STEM graduation rates for the 1996-97 cohorts were 24.8% for the LS-OKAMP schools and 23.8% for the STEM survey schools. The fifth-year within STEM graduation rates for the 1996-98 cohorts were 19.7% for the LS-OKAMP institutions and 19.4% for the STEM survey institutions. However, the fourth year graduation rates were higher in the STEM survey institutions than those in the LS-OKAMP institutions. The fourth year graduation rate includes the 1996-99 cohorts. The within STEM four-year graduation rates for URM students in this class were 8.8% and 6.8% respectively.*

The six-year graduation rates for URM students in the LS-OKAMP institutions is not only higher than the STEM survey institutions, as noted above, but it is interesting to note that they are also slightly higher than the participating LSAMP institutions in the national STEM survey. The six-year graduation rate within STEM fields for the 1996-97 cohorts in LS-OKAMP institutions is 24.8%, whereas the rate for the participating LSAMP institutions is 24.3%.

Thirty-two percent (31.5%) of the women who initially began their college careers in STEM at LS-OKAMP institutions as part of the 1996 and 1997 cohorts graduated within a STEM major within 6 years. The six-year within STEM graduation rate for female students was 35.0% for the STEM survey institutions.

## Summary

Underrepresented minority students in the LS-OKAMP schools who choose to major in STEM fields graduate within STEM and within six-years at rates equal to or better than the average six-year graduation rates of all other institutions participating in the CSRDE STEM study. The recruitment of underrepresented minority students in the STEM fields continues to be an issue nationally. The LS-OKAMP program institutions appear to be doing a little better in this regard than the STEM survey institutions.

In spite of progress made by LS-OKAMP institutions, we can agree there is room for improvement. The issues of retention and graduation remain. The LS-OKAMP institutions have demonstrated progress over time in retaining underrepresented minority STEM majors. However, the first-year retention rate of URM students within STEM fields attending LS-OKAMP schools is approximately 10% lower than the overall average of all CSRDE STEM participants. Retention is an issue that the LS-OKAMP schools will continue to focus on.

Interestingly, URM students who begin as STEM majors within LS-OKAMP institutions have higher first-year retention rates and six-year graduation rates than their URM peers who began in non-STEM fields. URM students who begin as STEM majors and then change to a non-STEM field appear to have the ability to perform college work. How can they be encouraged and supported to continue their work in a STEM field? Is it possible they could be re-directed into a different STEM field than the one they pursued originally?

URM students at the LS-OKAMP institutions who began as STEM majors graduated within six years and within STEM fields at rates comparable to the average rates of URM students attending all CSRDE STEM institutions. However, an average six-year graduation rate of 25% of URM students within STEM fields means that 75% of students who began as STEM majors either changed majors or left college. So here again, there continues to be work to do.

Over the course of the project the LS-OKAMP institutions have attempted to support URM students as they move through their academic undergraduate careers as STEM majors. We are seeing the results of this sustained effort both in the graduation rates and in the improved first-year retention rates over time. The LS-OKAMP institutions will need to continue this work, using the systems of student support that have been developed in order to sustain and advance the improvements in student retention and graduation that have been made.

## Comparison Tables

The tables below compare the most recent 6-year graduation rates and the most recent 2<sup>nd</sup> year continuation rates of underrepresented minority students for the individual LS-OKAMP institutions and the STEM survey institutions. In order to provide another perspective for comparison, these tables compare the individual institution to the overall rates of institutions with similar selectivity with regard to admissions requirements for ACT/SAT scores.

*Historically, as shown in **Table 1**, the 6-year graduation rates of URM STEM majors who begin in STEM and graduated within STEM while attending the LS-OKAMP public institutions have been greater than or equal to the national 6-year graduation rates observed in the CSRDE STEM studies for the URM cohorts of 1993 through 1997.*

**Table 1**

6-year Grad Rates  
for URM STEM Majors within STEM fields

	All STEM Participant Institutions	LS-OKAMP Institutions
1993	23%	26%
1994	24%	24%
1995	25%	27%
1996	24%	27%
1997	23%	23%

**Table 2** examines the six-year graduation rates of URM first-time full-time STEM majors in the cohort of 1997. Retention in this table is reviewed in two ways.

- **Any Major** –Any Major identifies the percent of URM students who began as freshman STEM majors and graduated within six years in any major at their institution.
- **STEM Major**- The STEM Major column identifies the percent of the URM students who began as freshman STEM majors and graduated specifically within a STEM field.

**Table 2**

1997 Freshman Cohort six-year graduation rates  
of underrepresented minority students  
who began as STEM majors and continued in  
ANY MAJOR or continued within a STEM major at institution  
Comparison of LS-OKAMP institutions with overall STEM rates by selectivity

	Any major	STEM major
Highly Selective STEM Institutions	53.1%	31.5%
OU	41.1%	23.0%
Selective STEM Institutions	41.4%	21.2%
OSU	45.1%	28.8%
Moderately Selective STEM Institutions	32.1%	14.3%
Cameron U	7.1%	7.1%
UCO	16.6%	8.3%
Less Selective STEM Institutions	31.9%	20.6%
East Central U	35.4%	19.3%
Langston U	32.7%	25.8%
Northwestern Oklahoma State U	60.7%	60.0%
Southeastern Oklahoma State U	31.9%	25.9%
Southwestern Oklahoma State U	8.3%	8.3%

Overall 1997 STEM institutions	40.2%	23.2%
LS-OKAMP institutions	35.3%	22.7%

As shown in **Table 2**, four of the nine LS-OKLAMP public institutions had higher six-year graduation rates for the 1997 cohort of URM STEM majors who remained in STEM than did all other institutions participating in the CSRDE STEM study with similar selectivity. These institutions included Oklahoma State University, Langston University, Northwestern State University and Southeastern State University. In addition, East Central State University’s six-year graduation for STEM majors within STEM was just slightly below that of its selectivity group.

The on-going challenge faced by the LS-OKAMP institutions has been retention. The LS-OKAMP institutions historically show lower retention of URM students within the STEM fields when compared with all other STEM participating institutions, as can be seen in **Table 3**. However, while the rates for the entire group of STEM participating institutions has remained relatively stable over time, the LS-OKAMP institutions have improved from a low of 46% first year retention of URM students within STEM to 53.6% first-year retention over the course of 1994-2002. On average from 1994-2002, 64.7% of URM across all STEM participating institutions that began as STEM as freshman, continued in college and within a STEM field the next academic year. For the LS-OKAMP institutions this rate was 53.7%. So, although improvements are being made overtime, there is still much to be done with regard to retention of URM STEM majors.

**Table 3**

2<sup>nd</sup> Year Continuation Rates of URM STEM Majors continuing in STEM fields

	All STEM Participant Institutions	LS-OKAMP Institutions
1994	64.9%	46.0%
1995	64.4%	52.9%
1996	64.7%	55.6%
1997	65.1%	48.9%
1998	65.2%	55.5%
1999	64.5%	56.8%
2000	64.8%	54.9%
2001	64.3%	57.2%
2002	64.4%	53.6%
1994-2002	64.7%	53.7%

**Table 4** examines the retention of URM first-time full-time STEM majors in the cohort of 1997. Retention in this table is reviewed in two ways.

- **Any Major** –Any Major identifies the percent of URM students who began as freshman STEM majors and continued to the second academic year, regardless of their major.
- **STEM Major**- The STEM Major column identifies the percent of the URM students who began as freshman STEM majors and remained specifically in STEM fields as they moved into the second year.

As can be seen in Table 4, the most recent retention rates indicate that many LS-OKAMP institutions lag behind the other STEM survey institutions both in retention of initial STEM majors in any field and of particular interest to this project, in retention with STEM fields. There are a couple of partners however, that may have lessons to share with the rest of the group. The University of Oklahoma’s second year retention rate for underrepresented minority students majoring in STEM fields is 59.2%, which represents a 3.3% improvement in retention rates for URM students over last year. Oklahoma State University is very much inline with its STEM peers in both areas, and Southeastern State University exceeds its peers in second year retention rates of URM STEM majors who remain in a STEM field.

Table 4

2002 Freshman Cohort 2 <sup>nd</sup> Year Continuation Rates of underrepresented minority students who began as STEM majors and continued in either ANY MAJOR or in a STEM major at institution		
Comparison of LS-OKAMP institutions with overall STEM rates by selectivity		
	Any major	STEM major
Highly Selective STEM Institutions	84.5%	70.7%
OU	77.6%	59.2%
Selective STEM Institutions	77.5%	63.1%
OSU	79.0%	61.6%
Moderately Selective STEM Institutions	73.8%	60.0%
Cameron U	53.8%	38.4%
UCO	60.0%	50.0%
Less Selective STEM Institutions	71.8%	61.8%
East Central U	53.6%	39.0%
Langston U	68.4%	47.3%
Northwestern Oklahoma State U	33.3%	33.3%
Southeastern Oklahoma State U	68.9%	65.5%
Southwestern Oklahoma State U	66.6%	42.8%
Overall 2002 STEM institutions	77.0%	64.4%
LS-OKAMP institutions	70.1%	53.6%

Submitted by Rosemary Hayes...

**Graduate School Participation**

Name	Graduate Degree Earned or Progress Toward Degree	Graduate Institution	STEM Discipline
Jennifer Mann	Ph.D. (2002)	University of Arkansas	Mathematics
Suzanne Tunnel Estes	Ph.D. (2002)	University of Oregon	Biological Science
Edward Daniel	Ph.D. (2003)	Oklahoma State Univ.	Electrical Engineering
Byron Quinn	Ph.D. Candidate	Oklahoma State Univ.	Biochemistry
Billy Gaston	Ph.D. Candidate	Oklahoma State Univ.	Computer Science
Daniel Wilson	Ph.D. Candidate	Carnegie Melon	Computer Science
Latricia Fitzgerald	Ph.D. Candidate	Meharry Medical	Biochemistry
Kelly Blehm	Ph.D. Student	?	Biochemistry
Joanne Gonzalez	Ph.D. Student	University of Oklahoma	Biochemistry
Adrias Casias	M.S.	Stanford University	Chemical Engineering
Chris Lee	M.S.	Univ. of Central Okla	Forensic Science
Bruce Williams	M.S.	University of Oklahoma	Engineering
Ryan Birkenfeld	M.S.	Oklahoma State Univ.	
Brett Cowan	M.S.	Oklahoma State Univ.	Civil Engineering
Cara Cowan	M.S.	Oklahoma State Univ.	Mechanical Engineer
Joseph Jones	M.S.	Oklahoma State Univ.	Civil Engineering
Kristi Perryman	M.S.	Oklahoma State Univ.	Environ. Science
Athena Dawson	M.S.	Tuskegee University	Chemistry
Bobby Gramling	M.S.	Oklahoma State Univ.	Biochemistry
Valorie Strange	M.S.	University of Arkansas	Biology
Thomas Patten	M.S.	Oklahoma State Univ.	Mechanical Engineer
Jacob Manjarrez	M.S. in Progress	Oklahoma State Univ.	Microbiology
Loretta Rush	M.S. in Progress	Oklahoma State Univ.	Plant Pathology
Nichole Singleton	M.S. in Progress	Oklahoma State Univ.	Physiological Science



Daniel Fox	M.S. in Progress	Oklahoma State Univ.	Computer Science
Lila Peal	M.S. in Progress	Oklahoma State Univ.	Biochemistry
Crystal Redden	New Graduate Student	Rice University	Chemistry
John Hall	New Graduate Student	University of Colorado	Biology
Michelle Stevenson	New Graduate Student	University of Oklahoma	Physics
Eleazar Madrid	New Graduate Student	University of Tulsa	Mechanical Engin.
Britney Grayson	New Graduate Student	Vanderville University	Biology
Erma Simms-Gaston	M.S. in Progress	Oklahoma State Univ.	Computer Science
Barry Trotter	M.S. in Progress	Johns Hopkins Univ.	Chemistry