

# OKLAHOMA LOUIS STOKES AMP

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



**2002 Report for  
Performance Effectiveness Review**

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

**at  
NATIONAL SCIENCE FOUNDATION  
ARLINGTON, VIRGINIA**

**30 November 2002**

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

**October 30, 2002**

**The National Science Foundation**

**4201 Wilson Blvd. ROOM 815**

**Arlington, VA 22230**

LOUIS STOKES OKLAHOMA ALLIANCE  
FOR  
MINORITY PARTICIPATION IN  
Science, Technology, Engineering, and Mathematics  
(LS-OKAMP-STEM)  
[FUNDED BY THE NATIONAL SCIENCE FOUNDATION]



**Participants in Fall 2002 Annual Research Symposium**

17 Oral Presentations  
20 Poster Presentations

**Participating Institutions**

Cameron University  
East Central University  
Langston University  
Northeastern State University  
Oklahoma State University  
Southeastern Oklahoma State University  
Southwestern Oklahoma State University  
University of Oklahoma  
University of Tulsa

**2002**

**PERFORMANCE EFFECTIVENESS REVIEW**

**Louis Stokes OKLAHOMA Alliance for Minority Participation in  
Science, Technology, Engineering, and Mathematics  
LS-OKAMP-STEM**

## Table of Contents

## Page

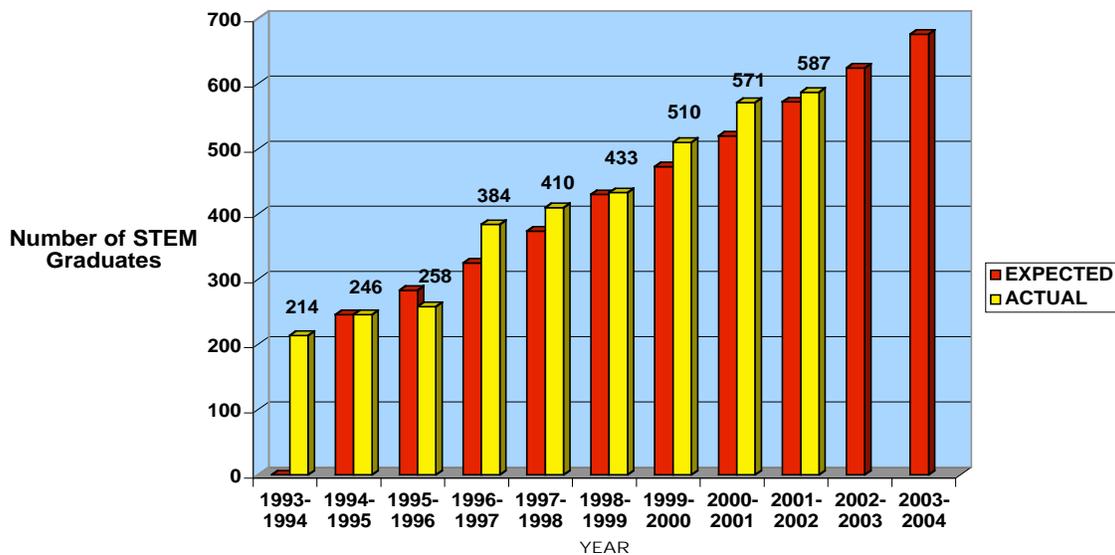
LS-OKAMP Baccalaureate Degrees Awarded 1994 to Present.....	5
Ethnic Distribution of Degrees Awarded.....	6
Recruitment and Retention Efforts.....	7
Bridge Programs.....	8-9
Highlights of Scholars' Program.....	9-12
Partnerships and Collaborations.....	12-13
Graduate School Preparation.....	13
Internships.....	14-15
Research Symposium.....	15-16
Graduate/Professional School Enrollees.....	17-18
Evaluation.....	19-26
Budgets	



Earl D. Mitchell, Jr., Ph.D.  
Program Director

**LS-OKAMP** began Phase I in 1994 with a baseline of **214** graduates from underrepresented populations earning baccalaureate degrees in STEM disciplines. Over the 5-year Phase I period that was marked by programmatic interventions and innovations, the baseline graduation rate progressively increased to **438** by the beginning of Phase II (1999). In years 1 and 2 of Phase II (1999-2000 and 2000-2001), the number of STEM degrees awarded to LS-OKAMP participants were **510** and **571**, respectively. This year we have increased to **587** (Chart Number 1) which is 174% above the 1994 (Phase I) baseline; 34% above the Phase II baseline of 438; and 2.8% above the previous year.

**Number of Graduates**



**CHART NUMBER 1:** Baccalaureate degrees in STEM fields from the 1994 baseline of 214. This includes all Partner and Affiliate institutions that are participants in the Louis Stokes Oklahoma AMP program.

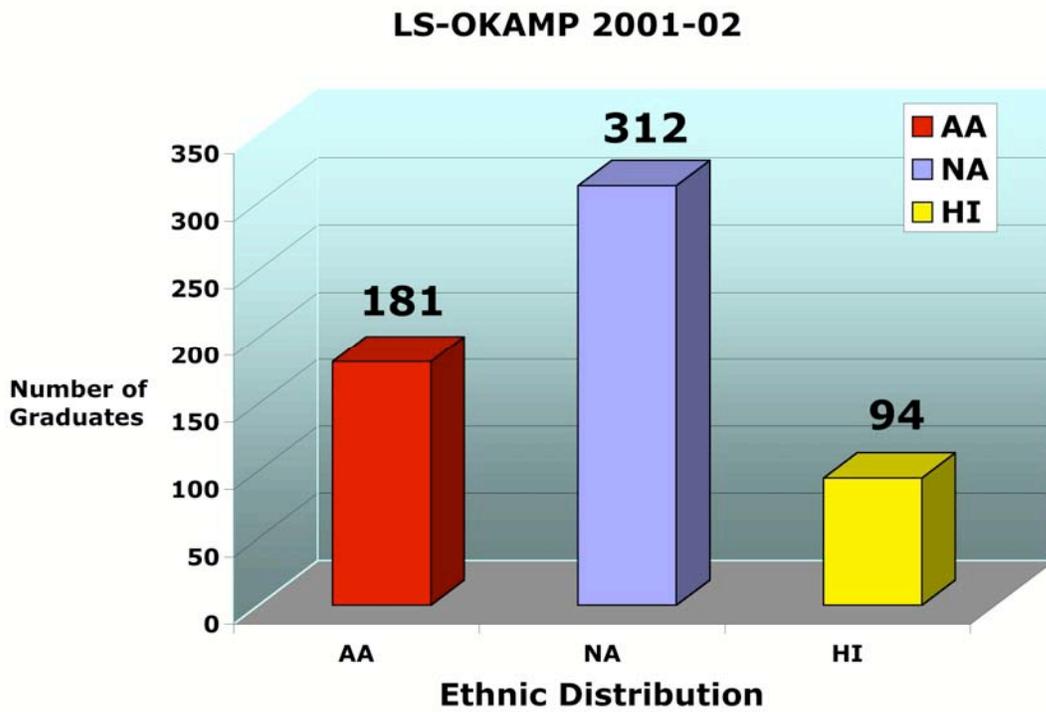
*“If I had not gotten into the LS-OKAMP program, I would not have gone to college. I was planning on joining the Air Force, but since I got into the program, I told myself I would do it since it was free.”*

- Constance Burris Chemical Engineer Oklahoma University

The primary goal of LS-OKAMP in Phase II is to increase by 15% annually the number of enrollees and graduates in STEM majors. The program also aims to enhance training through internal and external internships as well as motivate and prepare students for graduate school entry. Program components implemented to achieve these goals include:

- Ongoing efforts to recruit promising students through increased contact with high school personnel and extracurricular programs, direct contact with students and parents, community college collaborations, tribal educational offices, and one-on-one networking;
- Specially designed Bridge Programs for students entering college and for those transferring from 2-year to 4-year colleges;
- Retention interventions that provide skill-building programs for small and large groups, tutoring, counseling, mentoring, and interaction with STEM graduate students and faculty;
- Acquisition of research and applied experiences through internship opportunities at matriculating and other institutions of higher learning, national laboratories, private industry, and governmental agencies;
- Professional and peer support that involve various campus programs;
- Participation in research symposia and professional meetings; and
- Formalized graduate preparation programs.

**Chart Number 2** below, (Ethnic Distribution), shows that Oklahoma continues to lead in the number of Native American graduates in STEM fields. Of the 587 OKAMP graduates in 2001-2002, 53% or 312 were American Indian, 31% (181) were African American, and 16% or 94, Hispanic.



## RECRUITMENT/RETENTION EFFORTS

In order to reach a large pool of potential OKAMP participants, enroll them in an Alliance institution, and provide academic and social support, the Alliance employs broad-based recruitment efforts. Every effort is made to assess particular needs through individual and group meetings, campus-wide support networks, academic progress reports, campus involvements, and provision of a friendly and helpful environment. A summary of specific recruitment/retention efforts include:

- Direct contact with high school students, teachers, and parents through career fairs, science fairs, community activities, and special programs such as Upward Bound and Multicultural Encounter Day;
- Partnerships with community colleges;
- Mail outs and telephone calls to Tribal Educational Directors, high school; teachers and counselors, multicultural organizations, and various church groups;
- Distribution of brochures to community organizations and individuals;
- One-on-one contacts as a result of personal acquaintance or recommendations by matriculating OKAMP scholars and parents, and faculty/staff;
- Interaction of OKAMP scholars with pre-college and college students through academic and community volunteer programs;
- Distribution of brochures to STEM Departments ;
- Publicizing the LS-OKAMP program, its activities, and achievements of individuals;
- Distribution of the National LSAMP Magazine to high schools, organizations, STEM academic departments, faculty, and administration;
- Distribution of LS-OKAMP paraphernalia (pens, pencils, notepads, cups, tote bags) that include telephone number and website;
- Public recognition of participants for academic achievement;
- Distribution of OKAMP Newsletter;
- Weekly meetings with freshmen and sophomore *Cadre* groups that include academic survival skills workshops, career information, interactions with STEM graduate students, and interaction with STEM faculty;
- Tutoring;
- Faculty research training and mentoring;
- Mid-semester submission of academic status reports (grades) signed by each Instructor of participant;
- One-on-one counseling with Project Director, Campus Coordinator, or University Counseling and Career Staff member;
- Involvement in summer internships as well as local, regional, and national meetings/conferences that provide information, networking, and motivation relative to STEM majors and careers (i.e. LS-OKAMP Research Symposium, Regional Research Day, Oklahoma Academy of Science, American Indian Science & Engineering Society- AISES, American Chemical Society, Society National Institute of Science, EPSCoR's Women in STEM Conference, etc.).



**Recruiting for Oklahoma AMP program:** Dr. Carl Rutledge, ECU-OKAMP Director/Head of Physics Dept; and Ms. Kathy Niblett, ECU-OKAMP Campus Coordinator and Native American Counselor

### **BRIDGE PROGRAM HIGHLIGHTS**

*(Bridge Program funded, in part, by the Oklahoma State Regents for Higher Education)*

The Summer Residential Bridge Programs are designed to ease the transition from high school to college (and from two-year to four-year institutions). For summer '02, the Oklahoma State Regents funded four (4) Bridge Programs. The three programs that were implemented supported a total of 29 participants. (Langston University will implement program in Summer '03). Program activities are summarized below:

**Cameron University:** Ten (10) ethnically diverse high school graduates, of which 2 were male and 8 female, were enrolled. Eight (8) participants took 51 hours, with 35 hours of “A”; 15 hours of “B”; 3 hours of “C”, and 1 hour of “S”, earning a 3.82 GPA. There was difficulty in motivating two of the participants, both of whom were enrolled in 6 hours of remedial work. The recreational highlight of the program was a weekend canoe trip to Tahlequah. The trip was self-paid with subsidy provided by the CU Stokies Club. This outing provided an opportunity to get to know the students better in an informal setting. Bridge participants, including rural disadvantaged and first generation students, were mentored by OKAMP Campus Coordinator, Dr. T.E. Snider, along with Drs. Abbas Johari and James Johnson.

**East Central University:** Seven (7) participants; completed 34 hours of regular credit plus 3 remedial courses; average GPA was 3.09. All participants currently full-time students – 5 at East Central University (ECU), 1 at OK City Community College (OKCCC), and one at Oklahoma State University. Ethnic makeup: 3 Native Americans, 1 Hispanic, and 3 Caucasians. Participants received special instructions on how to succeed in college and were provided with a program to aid in making career decisions. They received daily tutoring and academic progress was monitored.

**Oklahoma State University:** Twelve (12) incoming freshmen participated in the 2002 Summer Bridge Program, enrolling in either College Algebra or Trigonometry and English Composition (3 credit hours each); or Calculus I only (5 credit hours). Mean GPA for each course was as follows:

- College Algebra..... 4.00
- Trigonometry .....3.83
- English.....3.00
- Calculus.....3.00
- **Overall GPA.....3.50**

Three (3) participants earned a GPA of 4.00.



Campus Coordinator , Brent Adams, (standing, left) and Bridge Program participants at Oklahoma State University, Summer '02

## About LS-OKAMP Scholars' Program

### Scholars Supported 2001-2002:

Cameron University.....	13
East Central University.....	23
Langston University.....	26
Northwestern OK State University.....	5
Oklahoma State University.....	38
Southeastern OK State University.....	15
Southwestern OK State University.....	7
University of Central Oklahoma.....	10
University of Oklahoma.....	17
University of Tulsa.....	26
Affiliates.....	04
<b>Total</b>	<b>184</b>

### 2001-2002 Activities:

#### Cameron University:

- Held 2 meetings per month; participated in social activities and fund-raisers;
- OKAMP scholars were actively involved in the hosting of the Fall '01 Oklahoma Academy of Science Meeting by serving as computer 'experts', projectionists, registration receptionists, 'gophers' to gather and return audio/visual equipment across campus, and servers at refreshment locations;
- More advanced students attended a group of seminars on GRE exams;
- Seven (7) participated in the Annual LS-OKAMP Research Symposium;
- Two (2) presented posters at Regional Research Day at UCO (Edmond OK);
- Assisted with mailouts and other activities in preparation for the March '02 OK Pentasectional Meeting of the American Chemical Society in Duncan OK;
- Participated in the Student Affiliates of the American Chemical Society (SAACS) Meeting 'in' Miniature (Stillwater OK, April '02).

**East Central University:**

- Students actively involved in professional organizations that include the Society of Physics Students, Sigma Pi Sigma Physics Honor Society, Biology Club, Mathematics Club, Computer Science Club, and Chemistry Club;
- Several students made presentations at Research Day in Edmond OK;
- Five (5) scholars presented posters at Annual OKAMP Symposium;
- Assisted in hosting the Arkansas-Oklahoma-Kansas section meeting of the American Association of Physics Teachers at ECU.

**Langston University:**

- During past year, scholars participated in a project entitled “*An Undergraduate Biomedical Education Program (UBEP) at LU*”, whose intent is to provide research training and prepare students for matriculation in doctoral degree granting institutions;
- Prior to student selections, visitations and tours for the purpose of meeting with prospective researchers were arranged at the University of OK Health Sciences Center (OUHSC), Oklahoma Medical Research Foundation (OMRF), University of Tulsa, University of Oklahoma, Oklahoma State University, and Langston University;
- Fifteen (15) students were selected to participate in the 8-week program and received funding toward room, board, tuition, fees, and a stipend. Participating institutions were: University of Oklahoma Health Sciences Center, Oklahoma State University, and Langston University;
- UBEP students completed a short course developed by Dr. Sonja Williams in *Biomedical and Research Ethics*;
- OKAMP students were able to participate in a Career Day (Fall '01) at which major doctoral degree institutions were invited to Langston University to recruit promising students from an underrepresented population in STEM disciplines;
- An additional step toward graduate school preparation is required participation in the recently implemented department of natural science seminar series;
- Scholars have the opportunity to participate in a GRE Preparatory Laboratory for Science Majors.

**Northwestern Oklahoma State University:**

- Some participants served as departmental volunteers and received mentoring by assisting STEM faculty in Computer Science, Biology, Mathematics with laboratory setups and various student-support activities;
- Research participant, Susie Hull, was mentored by Cindy Pfeifer-Hill and made presentation resulting from the work at the 9<sup>th</sup> Annual Student Research Scholarly Activity Fair at SWOSU;
- The above student also attended the fall meeting of Physics Teachers (Ada, OK) and made a poster presentation relative to physics for elementary students designed by the Society of Physics Students;
- Guadalupe Minjares assisted in tutoring athletes.

**Oklahoma State University:**

- Monthly Scholars meetings were held with speakers/presenters from STEM faculty, Career Services, Graduate College, and the University of NM;
- *Cadre* meetings (freshmen and sophomores) were held weekly, with speakers from various academic support units as well as SMET faculty and LS-OKAMP staff;
- Status Reports (requiring academic grade report signed by each professor) required periodically to monitor academic progress;
- Campus Coordinator and students participated in student recruitment fairs on and off campus;
- Several female scholars participated in the 2001 *Women in Science Conference* sponsored by EPSCoR;
- Graduate Assistant highlighted LS-OKAMP program to 25 minority high school students at the Rotary Youth Leadership Awards (RYLA) camp (Stillwater, OK).

**Southeastern Oklahoma State University:**

- Presentations (poster and oral) were made at the following meetings: LS-OKAMP Annual Research Symposium, Annual Oklahoma Research Day at the University of Central OK, National ACS Meeting in Orlando, FL; Annual Undergraduate Research Symposium at Southeastern, ROCK Conference at Northeastern State University (Tahlequah OK), and the Oklahoma Academy of Science Annual Technical Meeting;
- Professional memberships include: American Chemical Society, Student Affiliate ACS at SOSU, and Alpha Chi (National College Honor Society) at SOSU;
- One student, B.J. Bench, is planning to attend the Annual Biomedical Research Conference for Minority Students (ABRCMS) in New Orleans.

#### **Southwestern Oklahoma State University:**

- Two OKAMPers worked very closely with the Summer Science and Mathematics Academy;
- Computer programs, study guides, and text references in biology, anatomy, mathematics, and chemistry, purchased with OKAMP funds, have proven very beneficial to students;
- GRE Study Guides are also utilized by scholars;
- Campus Coordinator, Dr. Brian Campbell, and scholar, Joanne Gonzalez, made a presentation at the National Science Teachers Association CA meeting;
- Joanne Gonzalez placed 2<sup>nd</sup> in poster presentations at the NM AMP Regional meeting, and was awarded \$75, a certificate, and a HP graphing calculator;
- Desiree Connelly also attended NM AMP conference, making presentation on the SWOSU Summer Science and Mathematics Academy, of which she was an integral part;
- Student memberships include the National Biology Students Organization and the American Chemistry Science (local student group).

#### **University of Central Oklahoma:**

- Strong links established with two community colleges (Rose State and Oklahoma City Community College) and local high school have enhanced recruitment efforts;
- Scholars may enter the Ron McNair program to enhance their preparation for graduate school;
- Scholars have access to study skills training and tutoring;
- Participation in the UCO Multicultural Club is encouraged;
- Scholars participated in the following conferences: TX McNair Research Conference (Univ of North TX, spring '02; Research Day for Regional Universities; Liberal Arts Student Symposium, and the Annual LS-OKAMP Research Symposium at Oklahoma State University.

#### **University of Oklahoma:**

- OKAMP program is administered through the OU College of Engineering Multicultural Engineering Program (OU MEP);
- Administration arrangement allowed OKAMP students to receive all benefits associated with the OU-MEP that include: orientation course for freshmen and transfer students; clustering of participants into common sections; group and individual tutorial sessions; academic monitoring; and internship and research opportunities assistance;
- Fifteen (15) of the 17 students supported in 2001-2001 earned GPA's above 3.00 (including 4 with a 4.00); the two students earning less than 3.00 maintained a cumulative GPA above 3.00;
- Five (5) students participated in technical internships and 5 were involved in research projects
- In addition to the OKAMP stipend, 6 students received support from other sources.

#### **University of Tulsa:**

- Selection of OKAMP scholars normally based on ACT, high school GPA, and level of high school science and math classes, along with interest in post-baccalaureate studies and a research career in a STEM field;
- Students participate in 3 distinct parts of the TU-MP-STEM program – Summer Bridge Program, Summer Research Internship Program, and the academic-year Scholars Program;
- Most participants enter the TU-MP-STEM program through the Summer Bridge Program, a 4-week residential program that includes classwork, field trips, and other extracurricular activities;
- Research interns engage in a full time summer research project with UT faculty members in STEM fields; monthly research progress presentations are made to peers;

- The Scholars Program requires participants to attend bi-weekly colloquia and keep abreast of current research in their areas of interest;
- OKAMP scholars receive numerous benefits that include presentation opportunities, interaction and networking with peers and professionals, research experiences, broadened career outlooks, early insight into graduate studies, and formation of strong community in the TU-MP-STEM program as a result of sharing trials and triumphs.

## **PARTNERSHIPS AND COLLABORATIONS**

**East Central University:** Continues to work closely with faculty at *Seminole State Community College* and recruit promising students.

Campus Coordinator, Dr. Carl Rutledge, and another faculty, Dr. Thompson, are involved in the PT3 Program's grant for *Preparing Teachers for Teaching with Technology*. Technology usage includes Powerpoint, SkyGazer planetarium program in astronomy, the HITT program (Hyper-Interactive Teaching with Technology) in physics, wide use of computers in the Physics Department computer lab, mathematics computer lab, and the McNair Scholars computer lab.

**University of Oklahoma:** The OKAMP program is administered through the *OU College of Engineering*, an arrangement that brings all the partnerships and relationships not only of the College of Engineering, but other University units such as the *Office of Career Services*. The program has excellent relationships/partnerships with corporations/organizations that include **Shell Oil, Exxon-Mobil, 3M, IBM, Sandia National Lab, and GEM**. These partnerships serve as an avenue for students internships and scholarships. For example, during the 2001-2002 academic year, six (6) OKAMP students were funded by corporate scholarships in an amount exceeding \$30,000. OU sees this as a great way to support additional students.

In addition, OU's OKAMP continues to partner with the pre-engineering program at *Oklahoma City Community College*. To date, two (2) Hispanic students have transferred to OU in engineering. One graduated this past year and the other will graduate during this current academic year.

**Oklahoma State University:** The *Oklahoma State Regents for Higher Education* provided funds to support the 2002 Summer Bridge Program. Financial support for the 12 participating students included tuition, room and board, books, special laboratory needs, and field trips.

**Southeastern Oklahoma State University:** The *Oklahoma Center for the Advancement of Science and Technology* provided funds to support the research in which two (2) scholars are currently involved; and *Oklahoma State University's Department of Biological Sciences* employed 3 scholars during the academic year. Other partnerships/collaborations included the following: *Haliburton, Inc., US Fish & Wildlife Service, the Choctaw Nation, and the US Army Corps of Engineers*.

**University of Central Oklahoma:** OKAMP students are involved with *Upward Bound* that partners with three local high schools (Capitol Hill, Crooked Oak, and Star Spencer) having large minority enrollments. The interaction provides excellent recruiting opportunity.

**University of Tulsa:** The Tulsa-based *Zarrow Families Foundation* has enabled the TU-OKAMP scholars' support through a generous gift; and the *Oklahoma State Regents for Higher*

*Education* provided partial support for the Summer Bridge Program, through which most students enter the TU-OKAMP program .

**Langston University:** Partnerships/collaborations were established with the University of Oklahoma Health Sciences Center, Oklahoma State University, Yale University, and the Garza Goat Research Program at Langston University. LS-OKAMP students are recruited from participants in the Upward Bound Program, Summer Math and Science Academy, and high schools in the Langston, Guthrie, and Oklahoma City areas.



**Argenia Doss** presents poster at the Langston University's Research Symposium



**Dr. Rosemary Harkins**, LU-OKAMP Coordinator/Head of Biology Dept.

### **Graduate Preparation**

*Oklahoma State University:* Currently 6 engineering majors meet weekly in brown bag lunch sessions with former OKAMP Campus Coordinator, Valerie Shangreaux, who is currently a doctoral student in Educational Psychology and Gates Scholar. Topics discussed thus far are:

- 1) Who should you talk to in making the graduate school decision
- 2) Difference between undergraduate and graduate school
- 3) Full-time vs part-time attendance
- 4) Reasons to go straight through to graduate school
- 5) What is a thesis
- 6) Thesis vs non-thesis options
- 7) Where to look for a graduate school
- 8) What to look for in a graduate school
- 9) Entrance requirements
- 10) Choosing an area of study
- 11) Choosing a faculty advisor
- 12) How to fund graduate school

Remaining topics to be covered are:

- 1) Completing the application
- 2) Developing a resume'
- 3) Essay writing
- 4) Developing objective statements
- 5) Getting letters of reference

## INTERNSHIP PARTICIPATION

<i>Participant</i>	<i>Agency</i>
<i>Southeastern OK State Univ.</i>	
Dominic Barrett	Oklahoma State University
Wes Jones	Haliburton, Inc.
Chrystal Dixon	US Fish/Wildlife Service
Joe Barnett	US Fish/Wildlife Service
Stuart Kemp	Choctaw Nation
Carrie Dodd	US Army Corps of Engineers
Brian Chavez	US Army Corp of Engineers
Athena Dawson	SE Oklahoma State University
B.J. Bench	SE Oklahoma State University
 <i>University of Oklahoma</i>	
Jennifer Coffey	University of Oklahoma
Samuel Feldhake	Boeing
Zachary Hodge	3M
Jemeca Price	Coco-Cola, Science Div., Atlanta
Oscar Masters	University of Oklahoma
Mariana Dioniaio	Exxon-Mobil
Patrick Figaro	3M
Thomas Jones	University of Oklahoma
Mariam Raji	3M
Joseph Steen	University of Oklahoma
 <i>Oklahoma State University</i>	
Rachel Allen	OU Health Sciences Center
Fredrick Beartrack	Phillips Alaska Inc. (Kenai LNG Plant)
John Castro	Stanford Linear Accelerator Center
Kervin Colbert	TechTrol, Inc.
Tara Hamm	General Motors
Sofiri Hart	Exxon/Mobil
Christina Lupher	
Gerardo Myrin	Oklahoma Natural Gas
Thomas Patten	Mercury Marine
Teneca Pleasant	Oklahoma State University
Quentin Smith	Forest Ridge Development Co.
Brek Wilkens	Oklahoma State University
 <i>East Central University</i>	
ShenaleGlenn	REU at University of Michigan
Clint Cook	R.S. Kerr Envir. Research Lab
Ricky Davis	ECU Biology Department

Susan Hood  
Richard Walkup

R.S. Kerr Environmental Lab  
ECU Chemistry Department

Southwestern Oklahoma State University  
Joanne Gonzalez

OU Health Sciences Center

*Cameron University*

Kylie (Williams) Ward  
Tiffani Veal  
Rosemarie Culhane

Nat. Res./Envir. Div., Fort Sill, OK  
Inorganic Chem, Univ of OK  
Dynamic Research Corp.



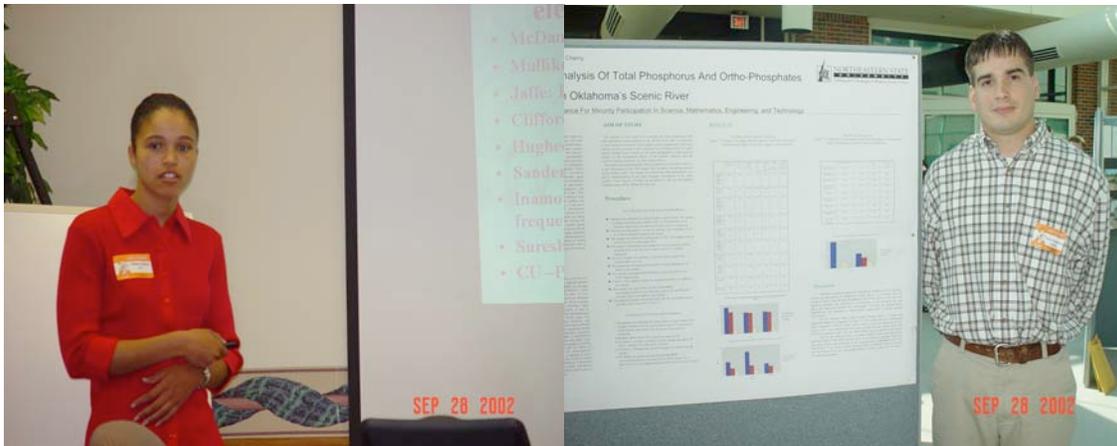
OSU mechanical engineering major, Fredrick Beartrack, interned with Phillips Alaska, Inc. at the Kenai LNG Plant, Summer '02.

## SEVENTH ANNUAL RESEARCH SYMPOSIUM September 28, 2002



OK State Univ. Scholars in charge of registration table.

Brian Chavez, Southeastern Oklahoma State Univ.



Tiffany Miller, Cameron University

Alex Henry, Northeastern State University



Scholars listen to physics & engineering presentations

Eleazar Madrid, University of Tulsa



Desiree Connely, SWOSU, receives participation award from LS-OKAMP Director, Earl D. Mitchell

Randolph Sillik and Manssa Muhammad (Langston Univ)

## GRADUATE/PROFESSIONAL SCHOOL PARTICIPATION



**Michael Heppler**, Assistant Director of the Oklahoma State University Graduate College, presents workshop at Fall '02 Research Symposium entitled "**KEYS TO SUCCESSFUL GRADUATE/PROFESSIONAL SCHOOL APPLICATIONS**"

### GRADUATE STUDENT FOCUS

**Daniel Wilson** (University of Tulsa, Spring '00) is a third year Ph.D. students in Robotics at Carnegie Melon University. He has completed all coursework, teaching and written requirements; with a speaking requirement, thesis proposal, and thesis remaining. His expected graduation year is 2006.

Last year, Daniel obtained a Masters degree in 'Knowledge Discovery and Datamining' from the Center for Automated Learning and Discovery (CALD). In the summers of 2001 and 2002, he interned at Microsoft Research and the Palo Alto Research Center (formerly Xerox PARC). He has published two papers (and has several more submitted) and has been included in two patent applications.

Daniel's research area is in ubiquitous computing. *The main goal of the research is to use robotics and machine learning to help people with physical and cognitive disabilities live independently in their homes.* He works mainly with his Advisor, Dr. Chris Atkeson, and has recruited five (5) undergraduates for various projects. His collaborations include researchers from the CMU Speech group, the Interactive Systems Lab, and the Human Computer Interaction Institute.

Currently, Daniel is funded by a NSF Fellowship that will expire at the end of this academic year.

## GRADUATE/PROFESSIONAL SCHOOL PARTICIPATION

<u>Name</u>	<u>Baccal. Instit./Major</u>	<u>Degree Earned/Instit.</u>	<u>Degree in Progress/Instit.</u>
<u>Billy Gaston</u>	<u>LU - Comp. Sci.</u>	<u>M.S., Comp.Sci., OSU</u>	<u>Ph.D., Comp. Sci., OSU</u>
<u>Byron Quinn</u>	<u>LU - Chemistry</u>	<u>M.S., Biochem, OSU</u>	<u>Ph.D., Biochem, OSU</u>
<u>Erma Sims</u>	<u>LU - Comp. Sci</u>		<u>M.S., Comp. Sci., OSU</u>
<u>LaToya Penny</u>	<u>LU - Comp. Sci.</u>		<u>M.S., Comp. Sci., OSU</u>
<u>Bobby Gramling</u>	<u>LU - Chemistry</u>		<u>M.S., Biochem, OSU</u>
<u>Leah Turner Gramling</u>	<u>LU - Chemistry</u>		<u>PharmD, Pharmacy, OUHSC</u>
<u>Chris Lee</u>	<u>LU - Biology</u>	<u>M.S., Forensic Sci, UCO</u>	
<u>Latricia Fritzgerald</u>	<u>LU -Chemistry</u>		<u>Ph.D., Biochem, McHarry</u>
<u>Barry Trotter</u>	<u>LU - Chemistry</u>		<u>M.S., Johns Hopkins</u>
<u>Tiffany Hutcherson</u>	<u>LU- Chemistry</u>		<u>M.S., OU Health Sci. Center</u>
<u>Daniel Wilson</u>	<u>UT - Computer Sci.</u>		<u>Ph.D., Comp. Sci., Carnegie M.</u>
<u>Jennifer Mann</u>	<u>ECU - Mathematics</u>	<u>Ph.D.-Math, Univ. AR</u>	
<u>Hannah Heather</u>	<u>ECU - Mathematics</u>		<u>M.S., Mathematics, Notre Dame</u>
<u>Bruce Williams</u>	<u>ECU - Engineering</u>	<u>M.S., Engineering, OU</u>	
<u>Athena Dawson</u>	<u>SEOSU-Chemistry</u>		<u>M.S.-Tuskegee University</u>
<u>Matt Jefferson</u>	<u>OU - Engineering</u>		<u>M.S. - Engineering, OU</u>
<u>Mita Young</u>	<u>OSU - Engineering</u>		<u>Rice University</u>
<u>Johnnetta Nesbitt</u>	<u>OSU - Chem Eng</u>		<u>University of Oklahoma</u>
<u>Adrias Casias</u>	<u>OSU -</u>	<u>M.S. Stanford Univ.</u>	
<u>Ryan Birkenfeld</u>	<u>OSU -</u>	<u>M.S.</u>	
<u>Brett Cowan</u>	<u>OSU - Civil Eng</u>	<u>M.S., Civil Eng., OSU</u>	
<u>Cara Cowan</u>	<u>OSU - Mech Eng</u>	<u>M.S., Mech Eng., OSU</u>	
<u>Edward Daniel</u>	<u>OSU - Elec. Eng., OSU</u>	<u>M.S., Elec. Eng., OSU</u>	<u>Ph.D., Elec. Eng., OSU</u>
<u>Joseph Jones</u>	<u>OSU - Civil Eng, OSU</u>	<u>M.S., Civil Eng., OSU</u>	
<u>Dawn Knight</u>	<u>OSU - Eng</u>		<u>M.S., Civil Engineering, OSU</u>
<u>Kristi Perryman</u>	<u>OSU -</u>	<u>M.S., Env. Sci., OSU</u>	
<u>Robert Merriweather</u>	<u>CU, Multimedia Des.</u>		
<u>Rochette Wurth</u>	<u>CU, Chemistry</u>		
<u>Robert Baker</u>	<u>CU, Computer Science</u>		
<u>Kenneth Drake</u>	<u>CU, Chemistry</u>		
<u>Jacqueline Cooper</u>	<u>CU, Computer Science</u>		

# PROGRAM EVALUATION

## Evaluation of Partner Goals and Achievements

This evaluation process began in March 2002 with the revision of the goals instrument. An individualized instrument was then forwarded to each LS-OKAMP institution in April 2002. Each institutional contact was advised to make any changes necessary to more accurately reflect their activities. The evaluation period was Summer 2001 through Spring 2002. The completed report was due in June 2002.

**The following section of the report addresses the goals and outcomes reported by the public LS-OKAMP partners.**

### Cameron University

Cameron University met or exceeded most of their goals for the year. They projected that majors in STEM fields would increase 2% per year, but the actual increase was just slightly higher at 5%. In addition, there were 12 minority Medical Technology majors and 14 Respiratory Care majors who were not included in Biology, and 4 minority Agri-Business majors who were not included in Agriculture. The 2001 Summer Bridge Program recruited 10 high school seniors with a collective GPA for the summer of 3.55, well above the goal of 2.5.

The goal to designate at least one LSAMP scholar from transferring junior college students was not achieved, and the Junior College Bridge Program has not yet been established.

### East Central University

East Central University successfully assisted their ECAMP students in preparing and applying for graduate schools. During the 2001-02 period, 10 of 13 (77%) graduates took part in the graduate preparation program (their goal was 75%), and all 10 of these students applied for graduate school before their final semester at ECU. They also had six students involved in summer research and presentations, two higher than their goal of at least four. East Central University was also successful in having the ECAMP STEM majors maintain a higher GPA than the average of all ECU students, other minority students, and all STEM students. The GPA averages were 3.32, 2.95, 2.86 and 2.98, respectively.

East Central University set a goal to increase STEM transfers from Seminole State College (SSC) to 5% per year. There were 33 STEM transfers from SSC in the fall of 2000 and 31 in spring 2001, but data was not provided for the fall 2001 transfers, so we were unable to determine if this goal was met.

### Langston University

Langston University met their goal to ensure that their scholars would develop their abilities to a level adequate for entry into graduate schools or professions. They projected that 40% of their LS-OKAMP scholars would be involved in research. This goal was achieved in 2001-02 when more than 20 (over 40%) of the 50 students enrolled in the program worked on research projects with their supervisors. There were two additions in Fall 2002 that should also help Langston students with graduate school entry. A new mathematics research course was added, and more formal procedures governing application to graduate school were implemented. In the

future, the latter should help them meet their goal of requiring students who qualify to submit two formal graduate school applications before graduation.

Langston University was unable to begin the Summer Bridge Program because of the illness suffered by the program coordinator.

#### Northwestern Oklahoma State University

Northwestern Oklahoma State University offered a Freshman Bridge Program in which 2 of 2 students (100%) successfully completed the program. In addition, by monitoring the GPAs of participating LS-OKAMP students and counseling those not performing to their level, the average GPA of OKAMP students (3.18) was higher than the average GPA of all other minority students in STEM fields (2.7).

It is unclear whether two of the goals for Northwestern Oklahoma State University were achieved. They hoped to provide all of the NWOSU faculty with program material to share with their students, as well as provide at least 75% of the high school superintendents in their area with program information to use in recruiting efforts. The results indicate that there was an increase in STEM majors, and one student changed from undecided to STEM, but there was no specific data to indicate that the assessment criteria were met.

#### Oklahoma State University

Oklahoma State University was very successful with their Summer Bridge Program for the summer of 2001. They supported 14 transfer students, and exceeded their goals of having 75% of the participants earn a 3.0 GPA during the summer (actual was 86%), and 80% of the students enroll for the fall semester (actual was 100%). Another objective was to have 50% of all students in the Scholar's Program participate regularly (80% participation rate) in required LS-OKAMP program activities. In Fall 2001, 75% of the students participated regularly, and in Spring 2002, the participation rate was 59%.

Nine of 22 continuing LS-OKAMP students (41%) participated in the Summer Research Internship Program, slightly below their goal of 50%. Some of Oklahoma State University's results were unavailable at the time of submission, so we were unable to determine if they met their goals of having 80% of all non-transfer participants graduate with a BS degree, and 60% of the Summer Bridge participants be enrolled at the start of their second year.

#### Southeastern Oklahoma State University

One of the goals for Southeastern Oklahoma State University was to increase research activities among participants. The projected number of seniors to be involved in some research activity was 66%, and 33% for juniors. The actual results were well above the projection. Ten of the 13 participants in the program (77%) were involved in research either as a summer intern, through mentor-supervised research during the semester, or both. The participation rate by class was as follows: seniors, 100%; juniors, 71%; sophomores, 66%; and freshmen, 100%. SEOSU also required its LS-OKAMP participants to attend one meeting during each of the spring and fall semesters, as well as meet individually with the coordinator at least once per semester.

In order to achieve the goal of increasing the number of LS-OKAMP applicants, Southeastern Oklahoma State University planned to ensure that students would receive information about the program from the following sources:

- All SOSU faculty in STEM fields
- All two-year colleges in the service area, and
- 75% of high school superintendents in the service area.

All of the faculty in the STEM fields were provided information on the LS-OKAMP program so they could announce availability to their students. However, only 50% of the two-year colleges and 30% of the high school superintendents in the service area were contacted.

### Southwestern Oklahoma State University

The LS-OKAMP program at Southwestern Oklahoma State University is continuing to grow, and they have met their goal of doubling participants by the end of year two. According to the report, there was one student in the program when Dr. Campbell took over, and three at the end of year one. There are now six participants, and one additional student was in the process of applying by the end of the 2001-02 period. In addition, they have increased advertisement and publicity of the program by using flyers and discussions during classes by the director and scholars. Moreover, the SWOSU Scholar's Program included all six participants during the 2001-02 year.

In order to assist the Scholar's Program participants with gaining admission to graduate programs, Southwest Oklahoma State University set a goal to involve at least 50% of the participants in an Undergraduate Research Internship Program. This number has not yet been achieved. Of the six LS-OKAMP 2001-02 participants, one student was actively involved in research and one student was pursuing summer off-campus research (33%).

### University of Central Oklahoma

The University of Central Oklahoma was successful in reaching their goal of having 100% of the graduating LS-OKAMP participants receive a BS degree in a STEM field. Their goal to have 74% of the new LS-OKAMP recruits graduate with a BS degree in a STEM field, and 67% of those students be eligible to attend an Oklahoma graduate school in a STEM field cannot be measured yet, but based on the June 2002 GPAs of the new recruits, UCO feels certain that these objectives will be met.

The University of Central Oklahoma set some very high goals for their program as indicated by the following examples:

- 100% of the LS-OKAMP participants will individually meet with an active researcher at least once per semester
- 100% of the LS-OKAMP participants will engage in extra-curricular research activities with a faculty mentor during their senior year

Although these goals were not met, the participation rates were positive. The first goal had a 75% success rate in Fall 2001, and 83% in Spring 2002. In addition, 2 of 3 seniors (67%) participated in mentored research. On the other hand, only 15% of the projected 25% of the LS-OKAMP students participated in the Summer Research Internship Program.

### University of Oklahoma

**The University of Oklahoma supported two students from Oklahoma City Community College through the establishment of an academic year transfer bridge program in the fall of 2000, and both students have maintained their GPA above 2.5, exceeding the program's goal of 50%. They also met their goal to have 50% of these students graduate within three years (one has graduated). In addition, out of 18 students who received funding during the 2001-02 academic year, 16 (88.8%) had a GPA of at least 3.0, exceeding their goal of 75%. Another success is that 85.7% of the LS-OKAMP participants graduated with a BS degree, slightly higher than their projection of 80%. Moreover, they exceeded their goal to have 80% of all non-transfer participants graduate with a BS degree (actual was 85.7%).**

Summary

As can be seen from the accomplishments addressed above, the reporting LS-OKAMP partners have made steady, positive progress toward achieving their performance goals. The importance of this work can be seen when we look at the STEM retention and graduation rates. In the coming year we need to work on improving the reporting process. We hope that we will have also have the participation of Tulsa. An additional component that we will add to the evaluation next year is direct feedback from student participants.

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## Examination of LS-OKAMP Retention and Graduation Rates

**In September 2002, C-IDEA published the third annual national STEM retention study, *2001-02 STEM Retention Report*. This report was based on data collected from 200 colleges and universities, including all nine of the LS-OKAMP public universities. The retention data for eight of the nine institutions was provided by Associate Vice Chancellor Debra Stuart 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 STEM survey focused on retention and graduation data for freshman cohorts from 1994 through 2000. 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 2001-02 STEM survey of 200 higher education institutions. Unless otherwise noted, the rates in the following section are the overall rates for the period 1994-2000.

In addition to this executive level report, we have prepared a detailed study of the LS-OKAMP schools, based on a subset of data obtained for the nine Oklahoma public institutions for the STEM report.

### Demographics

During the survey period 1994-2000, underrepresented minority students (URM) comprised a slightly higher percentage of the first-time, full-time enrollments at LS-OKAMP institutions (19.5%) as compared to the enrollments across all of the 200 STEM survey institutions (18.5%). Among STEM survey institutions, Hispanics accounted for 7.8% of the freshman enrollments during this period, and American Indian students accounted for 1.0%. In contrast, Hispanic students accounted for 2.8% of the freshman enrollments while American Indian students accounted for 9.2% 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 (21.7%) made up the freshman STEM cohorts at LS-OKAMP than made up the freshman STEM cohorts at the STEM survey institutions (17.9%). It is interesting to note that at LS-OKAMP institutions, the percentage of URM students enrolling in STEM fields was greater than or equal to their percentage of representation in the general population of all first-time freshmen.

Women comprised a majority (53-54%) of the first-time, full-time freshman cohorts of both the LS-OKAMP institutions and the STEM survey institutions. However, women made up between 37-38% 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 (including STEM) and the percent of beginning STEM majors who actually graduated in STEM fields. 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 1994-2000 URM cohorts majoring in STEM and graduating in any field was 77% within the STEM survey institutions and 74.4% within the LS-OKAMP institutions. Looking at URM students who began as STEM majors and graduated in STEM, the 2<sup>nd</sup> year continuation rate was 64.6% and 53.9% respectively.

Despite this apparent disparity in continuation rates, it is important to note that the LS-OKAMP institutions have made steady improvements in the “within institution” and “within STEM field” continuation rates from 1994 to 2000. In 1994 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 66.9%. By 2000 the rate had improved to 75.9%. Likewise, the 1994 2<sup>nd</sup> year continuation rate for URM students who began as STEM majors and continued as STEM majors was 46%. By 2000, the rate had improved to 59.3%. This is in contrast with an approximate 3% improvement in continuation rates for URM students during the same period in the STEM survey institutions.

In the STEM survey institutions we find that 82.3% of freshman women majoring in the STEM fields continued on to the 2<sup>nd</sup> year at their institution; and 66% 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, 76.9% and 53.3% respectively.

#### Graduation Rates

**Those URM students who stayed enrolled at LS-OKAMP institutions graduated within STEM fields at a consistently higher rate than URM students enrolled in the STEM survey institutions. The six-year within STEM graduation rates for the 1994 and 1995 cohorts were 25.7% for the LS-OKAMP schools and 23.2% for the STEM survey schools. The fifth-year within STEM graduation rates for the 1996 cohort were 21.4% for the LS-OKAMP institutions and 18.7% for the STEM survey institutions. The fourth year and most current graduation rate is for the 1997 cohort. The within STEM four-year graduation rates for URM students in this class were 8.5% and 7.6% respectively.**

Twenty-seven percent (27.4 %) of the women who initially began their college careers in STEM at LS-OKAMP institutions as part of the 1994 and 1995 cohorts graduated within a STEM major

within 6 years. The six-year within STEM graduation rate for female students was 35.2% for the STEM survey institutions.

### Comparison Tables

The tables below compare the most recent 6-year graduation rates (1995 cohort) and the most recent 2<sup>nd</sup> year continuation rates (2000 cohort) 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.

<b>1995 Freshman Cohort six year graduation rates of underrepresented minority students who began as STEM majors and continued in ANY MAJOR or a STEM major at institution</b>		
Comparison of LS-OKAMP institutions with overall STEM rates by selectivity		
	<b>Any major</b>	<b>STEM major</b>
<b>Highly Selective STEM Institutions</b>	53.8%	32.0%
OU	42.5%	31.3%
<b>Selective STEM Institutions</b>	38.4%	19.5%
OSU	54.7%	50.0%
UCO	5.9%	0.0%
<b>Less Selective STEM Institutions</b>	29.3%	17.7%
Cameron U	20.7%	13.8%
East Central U	28.6%	23.8%
Langston U	33.3%	24.2%
Northwestern Oklahoma State U	*	*
Southeastern Oklahoma State U	26.9%	21.2%
Southwestern Oklahoma State U	22.2%	11.1%
Overall 1995 STEM institutions	39.8%	22.8%
LS-OKAMP institutions	36.0%	27.3%
* not reported due to privacy issues		

**Table 1**

**As can be seen in Table 1, LS-OKAMP schools graduated a higher percentage of the 1995 freshman STEM cohort in STEM degrees than the STEM institutions as a whole. Although there is room for overall improvement, the breakdown by individual institutions helps identify those institutions with which the LS-OKAMP program can focus special attention and support.**

As can be seen in Table 2, the most recent retention rates indicate that the 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: OSU, which is surpassing its peer group in both areas, and Cameron and Langston who are showing improvement in retention.

2000 Freshman Cohort 2nd year continuation rates of underrepresented minority students who began as STEM majors and continued in ANY MAJOR or a STEM major at institution		
Comparison of LS-OKAMP institutions with overall STEM rates by selectivity		
	Any major	STEM major
<b>Highly Selective STEM Institutions</b>	85.2%	72.1%
OU	85.8%	64.2%
<b>Selective STEM Institutions</b>	76.9%	63.3%
OSU	80.0%	74.3%
UCO	63.6%	45.5%
<b>Less Selective STEM Institutions</b>	72.9%	63.5%
Cameron U	75.6%	62.2%
East Central U	60.5%	36.8%
Langston U	68.1%	59.6%
Northwestern Oklahoma State U	*	*
Southeastern Oklahoma State U	72.2%	44.4%
Southwestern Oklahoma State U	53.3%	46.7%
Overall 2000 STEM institutions	78.1%	66.2%
LS-OKAMP institutions	75.9%	59.3%
* not reported due to privacy issues		

**Table 2**

Summary

In spite of the areas where LS-OKAMP institutions performed better than the overall STEM survey institutions, we can agree there is a lot of room for improvement. Only a more detailed analysis of the accompanying report would fully identify retention and graduation issues that would be worthy of further attention. However, there are a few issues that might be worth deeper examination within the LS-OKAMP program. First, recruitment of underrepresented minority students and women 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. Second, the

issue of retention rates is important, particularly the 2<sup>nd</sup> year continuation rates. The LS-OKAMP institutions seem to be making good progress in graduating underrepresented minority STEM majors that stay within their programs. Last, the recruitment, retention and graduation of women within the STEM fields seems worthy of continued attention nationally and within the LS-OKAMP programs.

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# **BUDGETS**