

Annual Report for Period:07/2003 - 07/2004**Submitted on:** 05/28/2004**Principal Investigator:** Manning, Jean .**Award ID:** 0310321**Organization:** Langston University**Title:**
Langston's Integrated Network College for Science, Technology, Engineering and Mathematics**Project Participants****Senior Personnel****Name:** Manning, Jean**Worked for more than 160 Hours:** Yes**Contribution to Project:****Name:** Coleman, John**Worked for more than 160 Hours:** Yes**Contribution to Project:****Name:** Goodman, Nathaniel**Worked for more than 160 Hours:** No**Contribution to Project:**

Nathaniel Goodman is not a CoPrincipal Investigator in this project. He is Director of Sponsored Programs.

Post-doc**Graduate Student****Undergraduate Student****Name:** Howard, Christianna**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Ms. Howard worked as an office and lab assistant @ \$7.00 per hour

Name: Martin, Tristan**Worked for more than 160 Hours:** Yes**Contribution to Project:**

T. Martin worked as a lab assistant @ \$7.00 per hour

Name: Anderson, Quincy**Worked for more than 160 Hours:** Yes**Contribution to Project:**

SI Leader \$1500 per semester

Name: Doss, Argenia**Worked for more than 160 Hours:** Yes**Contribution to Project:**

SI leader @ \$1500/ semester

Name: Harris, Steven**Worked for more than 160 Hours:** Yes**Contribution to Project:**

SI leader @ \$1500/semester

Name: Stevenson, Steven

Worked for more than 160 Hours: Yes

Contribution to Project:

Office assistant \$7.00 per hour

Name: Carroll, Deidre

Worked for more than 160 Hours: Yes

Contribution to Project:

SI leader @ \$7.00 per hour

Name: Patterson, James

Worked for more than 160 Hours: Yes

Contribution to Project:

SI leader - paid from other source

Name: Burdex, Ashley

Worked for more than 160 Hours: Yes

Contribution to Project:

SI leader - paid through other source

Name: Evans, Marchonda

Worked for more than 160 Hours: Yes

Contribution to Project:

SI leader - paid through other source

Technician, Programmer

Name: Johnson, Leander

Worked for more than 160 Hours: Yes

Contribution to Project:

Mr. Johnson assists with computer and Web design programs. Part-time at \$2,500 per semester

Other Participant

Name: Stevenson, Bonita

Worked for more than 160 Hours: Yes

Contribution to Project:

Bonita Stevenson was the program coordinator for LINC at a salary of \$30,000/ yr.

Name: Ealy, David

Worked for more than 160 Hours: Yes

Contribution to Project:

David Ealy performed in-kind recruiting services for LINC at various high schools throughout Oklahoma and US.

Name: Lewis, Sharon

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Lewis facilitated the trial course-enhancement colloquium for general chemistry II for the spring 2004 semester and serves as coordinator for the curriculum enhancement program for LINC. Her addendum fee was \$1500 per semester.

Name: Jones, Doris

Worked for more than 160 Hours: Yes

Contribution to Project:

Doris Jones coordinated the supplementary instruction (SI) program for LINC and SURE-STEP collaboration for the spring semester 2004 and will continue for fall 2004. She was supported by EPscore for the spring semester and will be supported by LINC and Sure-Step in the fall. Her support is \$1500 per semester.

Name: Hill, Anthony

Worked for more than 160 Hours: Yes

Contribution to Project:

Anthony will coordinate the data collection and analysis for the evaluation processes. He will be supported by LINC at 1500 per semester.

Name: Poudavood, Reza

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Poudavood will coordinate the efforts for faculty training and enhancement activities. LINC will support at \$1500 per semester.

Name: Chan, Douglas

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Chan will supervise the usage, upkeep and instructional efforts for the research instrumentation in the instructional laboratory. LINC will support at \$1500 per semester.

Name: Barker, Shawn

Worked for more than 160 Hours: Yes

Contribution to Project:

Mr. Barker will mentor undergraduate in a summer research project @ \$2000

Name: Matand, Kanyard

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Matand mentors student in research - Paid through other funding.

Name: McMahon, Timothy

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. McMahon mentors students in research activities - Paid through other funding.

Name: Williams, Robert

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Williams mentors students in research activities - paid by funding from other sources.

Name: Abraham, K.

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Abraham mentors students in research projects - paid through other sources.

Name: Benson, Bruce

Worked for more than 160 Hours: Yes

Contribution to Project:

Mr. Benson is a university recruiter for LINC - inkind services

Name: Harkins, Rosemary

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Harkins, Chair Biology Department, is on the internal advisory board, TEAM

Name: Hedge, Clarence

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Hedge, Chair of Technology department, is on the internal advisory board, TEAM

Name: Ro, In

Worked for more than 160 Hours: No

Contribution to Project:

Dr. RO is on the internal advisory board, TEAM

Name: Burns, Marvin

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Burns, Dean of Agriculture & Research & Extension at LU, is on the internal advisory board, TEAM.

Name: Clark, Joan

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Clark, Dean of HONORS Program, is on the internal advisory board, TEAM. She offers collaborative financial& personel support.

Name: Williams, Sonya

Worked for more than 160 Hours: Yes

Contribution to Project:

Dr. Williams, Director of UBEP, is on the internal advisory board, TEAM

Name: Carter, Craig

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Carter, Director of Talent Search, is on the internal advisory board, TEAM

Name: Holloway, Ernest

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Ernest Holloway, president of Langston University is chair of the external board, PAC. He brings outstanding vision and leadership to the LINC program.

Name: Dale, Louis

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Dale is on the external advisory board, PAC.

His exensive experiences with large NSF projects & grants will bring enormous benefit to this advisory board.

Name: Mitchell, Earl

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Mitchel, Professor, Biochemistry and Director of Oklahoma Alliance for Minority Participation (OKAMP)at Oklahoma State University, Stillwater, OK, is on the external advisory board, PAC. He offers experience in managing NSF programs and offers a collaboration with NSF-OKAMP.

Name: Nelson, Donna

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Nelson, Professor, Organic Chemistry, University of Oklahoma, is on the external advisory board, PAC. She offers the opportunity for research internships for LINC faculty and students at OU.

Name: Barrick, Kirby

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Barrick, Assoc Dean, Academic Program, University of Illinois, is on the external advisory board, PAC. He offers the opportunity for research internships for LINC faculty and students at U of I.

Name: Jones, Wayne

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Jones, Director of Engineering at Tinker Air Force Base, OKC, Ok. will assist in obtaining internships at Tinker as well as give expert advise in his area.

Name: Ross, Richard

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Ross, Dean, College of Agriculture, Iowa State University, is on the external advisory board, PAC. He offers the opportunity for research internships for LINC faculty and students at ISU.

Name: Lindsay, Donald

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Lindsay, Assoc. Dean and Director of Academic Affairs, New Mexico State University, is on the external advisory board, PAC. He offers the opportunity for research internships for LINC students at NMSU.

Name: Bell, Paul

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Bell is on the external advisory board, PAC.

Name: Mize, Dolores

Worked for more than 160 Hours: No

Contribution to Project:

Dr. Mize, Associate Vice-Chancellor for Oklahoma State Regents of Higher Education, is on the external advisory board, PAC. Dr. Mize manages all of the Board of Regent's academies for grades K-12 for the state of Oklahoma. She will offer various outreach opportunities among the K-12 population for the LINC program.

Name: Hayes, Rosmary

Worked for more than 160 Hours: No

Contribution to Project:

Rosemary Hayes is the external evaluator. LINC supports a rate of \$500/day.

Research Experience for Undergraduates

Organizational Partners

Other Collaborators or Contacts

Part I. 3. Have you had other collaborations or contacts?

One of LINC's major strategies is to provide strategic financial and developmental support to program participants in order to attract more quality students in the STEM areas. These funds are needed to compete with larger universities that do not have as good a track record as Langston for graduating minority students in STEM disciplines. Langston University wholeheartedly endorses LINC's efforts, and has supported collaborations with an array of programs that include financial, developmental, and recruiting resources.

- Scholarship collaborations with NSF- (OKAMP) Oklahoma Alliance Minority Program, (UBEP) Undergraduate Biomedical Program, and Honors Program at LU.

This financial collaboration expands the number of scholars in the LINC program.

The LINC Program originally was scheduled to accept 12-15 participants for the first year. However, due to effective leveraging of the scholarship monies with the OKAMP, UBEP and the HONORS Programs at Langston, the LINC program was able to accept 26 scholars (3.0 and above) for the first year, using less than half the allowed budget. LINC participants who are also part of the HONORS program (which has a higher g.p.a. requirement) are required to maintain their scholastic status. However, future selections are made and scholarship budgetary allowances are managed realizing the possibility that a LINC participant may lose their HONORS status and still be eligible for LINC.

2. Summer Research Internship program collaboration with LINC & UBEP.

This financial collaboration creates a qualified pool of potential LINC scholars.

The LINC Program will sponsor 25 STEM scholars with summer research internships during this first year, 2004-summer term. Sixteen (16) of these scholars will be directed in research projects by nine (9) LU STEM faculty. All projects will culminate with a poster presentation. This \$60,000 effort is supported by an equal financial collaboration effort with the UBEP Program.

3. SURE- STEP Summer Bridge Program for perspective STEM majors.

This collaboration provides a pool of potentially qualified LINC scholars as well as developmental opportunities for existing LINC Scholars. It also serves as an outreach effort into the Oklahoma community.

The LINC Director & Staff will participate in this summer bridge program (sponsored by the NSF) by teaching Chemistry and Physical science. The 20 participants will be high school scholars who will be entering Langston for the 2004 fall term in a STEM curriculum. They will be acclimated to LU & LU's STEM departments and will receive a \$500 stipend during the month of July. The LINC program will provide LINC tutors and SI student instructors. Excelling bridge students will be offered LINC scholarships for the fall semester.

4. Langston University Department of Education

This collaborative recruiting effort with LU's Department of Education provides large-scale access to high school students throughout Oklahoma.

LINC participates in a variety of large scale recruiting events at the university sponsored by the department of Education. Over 30 different high schools and 6,000 high schoolers from various towns throughout Oklahoma participate. Most high schools attending have collaborative programs with the department of Education at LU.

5. TALENT SEARCH

LINC's collaboration with TALENT SEARCH provides recruitment services, as well as access to students who excel on the ACT test. This program provides In-kind services that include recruiting Personnel, service-learning tutorial opportunities for LINC participants, data bank of excelling ACT-testing participants, and other vehicles for recruitment. A LINC scholar, Desmond Harvey, was chosen tutor of the year for the Talent Search Program.

6. Faculty Training Center & University Collaboration

This state-of-the art facility provides In-Kind training for the STEM faculty for the implementation of technology in the classroom. Some of the training activities include training in Computer Technology Integration, Web CT, Web Design, egrade, Visualization Techniques, Microsoft Programs, etc. Over 15 STEM faculty have received training from this facility this year. The LINC program has acquired a computer specialist and web master (Leander Johnson) to personally assist the STEM faculty in this endeavor. The university is also offering stipends to STEM faculty to receive training in WebCT during the summer 2004 session. Our goal is to have most of the STEM faculty using WebCT by the end of the 2004-5 school term.

7. Other Faculty Training

Langston's collaboration with LINC to ensure continuous training and development for STEM faculty has resulted in its sponsorship via Whitehouse Initiative of a Technical Assistance Proposal Writing Workshop on February 26-27. Six STEM faculty attended.

Additionally, LINC supported Faculty travel to various other training workshops. Two professors traveled to Washington D.C. for a QEM workshop for grant writing. Others traveled to proposal evaluation workshops in the same area.

Other university sponsored trips included travel to the National Association of Neuroscience in New Orleans, the National Association of Naturalist Meeting held in Sweden and the National Mathematical Association annual Meeting.

8. EPSCoR and LINC Collaboration for Supplementary Instruction (SI).

LINC and EPSCoR collaborated to provide LINC's first curriculum enhancement program, Supplementary Instruction (SI).

SI is a program that focuses on historically difficult classes (e.g. Chemistry, Biology, Algebra, Calculus, etc.) and is active at 500 institutions across the US. The goals of SI are to improve student grades, reduce the attrition rate within those courses, and increase the graduation rates of students. It helps students master course content while they develop and integrate learning and study

strategies.

In keeping with LINC's stated planned activity of implementing STEM course curriculum enhancements, it financed a SI training workshop on inquiry-based instruction facilitated by Dr. Kay Patterson of the University of Missouri-Kansas City. Attendees included 15 STEM faculty along with faculty from Physical Therapy, Education, and Nursing during January 12-13, 2004.

Dr. S. Williams obtained supplemental funding from EPSCoR to support the implementation of SI instruction for the spring 2004 semester. A SI 'Train-the-Trainer' workshop was conducted for 10 LINC students by Doris Jones. Four (4) of the 10 LINC students who participated were funded by LINC and the other 6 students plus 6 faculty mentors were sponsored by EPSCoR.

During the spring 2004-semester, trained LINC students facilitated SI sessions for courses in algebra, general chemistry I, general chemistry II, biology I and Organic chemistry II.

The following departments participated in SI courses during Spring 2004 session:

The Department of Mathematics
The Department of Biology
The Department of Chemistry

Activities and Findings

Research and Education Activities:

1. Describe the major research and education activities of the project.

Major education and research activities are listed by category.

EDUCATION CATEGORY:

In support of LINC's goal of increasing the number of underserved students who receive undergraduate and advanced degrees in STEM disciplines, and to increase the number of Langston's STEM graduates by 15% annually, LINC has implemented a number of programs during year 1 of its grant period.

Two of the aforementioned programs also support LINC's Curriculum Enhancement Program, designed to address pre-existing deficiencies of incoming STEM majors, incorporate preparation for nationally standardized testing into standard curriculum, ensure that students are motivated and well prepared for graduate school entry and program completion, and support personal and professional development. These programs are 1. Supplementary Instruction (SI), and 2. A Trial Curriculum Enhancement Colloquium in General Chemistry II.

(1)Supplementary Instruction (SI)

(A collaboration between LINC and EPSCoR for Curriculum Enhancement)

Doris Jones will facilitate SI Instruction.

SI is a program that focuses on historically difficult classes (e.g. Chemistry, Biology, Algebra, Calculus, etc.) and is active at 500 institutions across the US. The goals of SI are to improve student grades, reduce the attrition rate within those courses, and increase the graduation rates of students. It helps students master course content while they develop and integrate learning and study strategies.

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During the spring 2004-semester, trained LINC students facilitated SI sessions for courses in algebra, general chemistry I, general chemistry II, biology I and Organic chemistry II.

The following departments participated in SI courses during Spring 2004 session:

The Department of Mathematics
The Department of Biology
The Department of Chemistry

All STEM faculty, who are participating in the curriculum enhancement programs, received SI training. Techniques learned in the SI workshop will be utilized in future SI instruction, regular classes, as well as in LINC's curriculum enhancement colloquiums that will be implemented fall 2004.

Note: SI training will continue during the Fall, 2004 school year.

While it is too early to assess impact of this activity, SI is a best practices technique that supports improved performance in STEM courses.

(2) Curriculum Enhancement Trial Colloquium

Dr. Sharon Lewis will assist with the curriculum enhancement program.

In keeping with LINC's stated planned activity of implementing STEM course curriculum enhancements, a trial colloquium for General Chemistry II (colloquium CH 1501) was conducted during the spring 2004

semester that will be a prototype for subsequent colloquiums. 7 students participated. The ACS national standardized exam for Gen. Chem II was used as the curriculum guide and as the pre and post test assessment vehicle. Inquiry-based teaching was utilized.

Elements of the Preparation for Success (PFS) colloquium (NP 3011), wherein students were encouraged to apply for summer research internships, were included to gauge impact.

Preliminary data indicates a high level of student interest. The 7 participants, in general, outscored their counterparts (who did not participate in the colloquium) on the standardized exams. The 'average' mean score for participants, however, indicated that more time should be allocated to this course enhancement. Enhancement courses that are slated to be offered in the Fall 2004-semester are recommended to be 2 hours in duration.

Elements utilized from the PFS colloquium proved quite successful. 5 of the 7 participants were accepted for summer internships: 2 in NSF summer research programs, 1 at the Univ. of Cal at Davis, and another at the Univ. of North Carolina at Chapel Hill.

While it is premature to assess impacts, we anticipate that preliminary data represents 'tip of the iceberg' potential for students' improved performance at a national level.

NOTE: Additional curriculum enhancement colloquiums for the biology, chemistry and mathematics departments will be implemented for the fall 2004-semester for the following courses:

Biology I & II
 Chemistry I & II
 Organic Chemistry I & II
 Calculus I & II

In addition, four (4) Practice-for-Success (PFS) Colloquiums will be implemented

(3) Math Tutorials

(In-Kind collaboration with Langston University)

LU provided Math software programs to assist in excelling in this STEM discipline:

Educause: tutorial
 ALEX: Advanced software for Calculus
 MAPLE V: Advanced math software
 Mathematica: software tool

Case studies and best practices suggest that this and other education enhancements will impact the retention rate and performance of students in the LINC program. It is too early to assess impact.

(4) Hand-held PDAs (Personal Digital Assistance)

Charter LINC scholars were given PDAs to demonstrate how technology assists learning, assist in their managing schedules and commitments, serve as a learning-assist tool in the PFS colloquiums and serve as a personal computer. The PDA has wireless capability. Students can obtain Internet access for classroom participation, and enjoy mentor-student & student-student sharing of digital information at a moments notice.

This and other education enhancements will impact the retention rate and performance of students in the LINC program. It is too early to assess impact.

(5) Faculty Education: Faculty Training

(A collaborative effort with Langston University)

Effective faculty is crucial to the success of all educational programs. LU is committed to support LINC by supporting faculty education in technology and new teaching methods. To this end LU's faculty training facility (FTC Center) and staff provide In-Kind training for STEM faculty in technology in the classroom.

During the fall 2003 and spring 2004 sessions, over 15 STEM faculty have received training in Computer Technology Integration, Web CT, Web Design, egrade, Visualization Techniques, and Microsoft Programs. LINC has acquired a computer specialist and web master (Leander Johnson) to personally assist the STEM faculty in this and related endeavors.

In addition LU has offered faculty stipends to STEM faculty who will develop their WEBCT options, develop new courses or enhance existing courses during the 2004 summer session.

STEM faculty will implement this leaning into its teaching methods during the Fall, 2004 term, and anticipate that they will enhance students' learning experiences.

(6) Education support: Mentoring

Although mentoring is embedded in special research programs, each LINC participant has been assigned a faculty mentor who is required to meet with assigned students bi-monthly. 9 mentors are assigned to 26 LINC scholars.

It is anticipated that mentoring relationships will uncover potential problems before they become real issues, and assist in finding solutions to them. As a result, LINC scholars are more likely to meet or exceed requirements of the program as well as remain in STEM disciplines.

Each STEM department recommends STEM candidates for LINC and assigns mentors. Participating departments include Biology, Chemistry, Agriculture, Mathematics, Technology, and Computer Science.

Note: plans are underway to assign mentors to all STEM majors.

RESEARCH ACTIVITIES:

Student Research is one of LINC's strategies to improve the retention rate of STEM students. Through this experiential learning, students will be exposed to challenging and exciting applications of 'book learning'.

LINC has established a number of collaborations that provide these enriching experiences for LINC scholars. Specific arrangements are as follows:

- (1). LINC will financially sponsor two STEM scholars to join a LU professor, Dr. Timothy McMahon, at the NASA Goddard Space Center in Greenbelt, MD for research activities during the 2004-summer term. Dr. Timothy McMahon will be working on the SWIFT Mission.
- (2). The LINC-UBEP Summer internship collaboration will financially sponsor 16 STEM scholars to work with 9 LU faculty in summer research activities. This \$60,000 project is shared equally.
- (3). Eleven (11) other LINC scholars obtained summer research internships from various programs. Two of these will be at NSF research centers.

All research projects are expected to culminate with an oral and poster presentation.

(4). STEM Instructional Laboratory

Dr. Douglas Chan will facilitate instruction.

The Instructional laboratory has acquired appropriate equipment and will be operational during the summer 2004 session. Equipment includes: high performance Liquid Chromatography, Infra Red Spectrophotometer, UV Spectrophotometer, Gas Chromatograph.

This STEM Instructional Laboratory will be the base for introducing students to state-of-the-art laboratory equipment, and enhance tutoring and mentoring efforts. It will also enhance student interaction and laboratory skills development. It is anticipated that it will attract students who may be on the borderline of attending a larger university because of access to state-of-the-art facilities.

(5). Research Conferences and Presentations

(a). NSF convention

LINC supported 2 LINC scholar participants' attendance at a NSF national convention at North Carolina A & T during February 26-27, 2004. Each presented a poster presentation of respective research projects.

(b) Beta Kappa Chi-NIS National Convention

LINC Supported 12 STEM students' attendance at Beta Kappa Chi-NIS national convention, Houston, TX, March 24-28. Each student presented an oral or poster presentation.

(c) Research Day

Research day for undergraduate research papers was presented at the Oklahoma state capitol during March 2004. All schools in the state of Oklahoma were allowed to send a representative for the research competition. James Patterson, a LINC participant won 2nd place in this state-wide competition.

(d) The School of Arts & Sciences

The School of Arts & Sciences presented its annual Research Day in April 2004. 43 STEM majors presented their research projects either as an oral or poster presentation

SEIS DATA AND REPORTING:

The SEIS baseline data for LINC was submitted on schedule, first on January 30, then on April 30, 2004. However, data for the category for 'pre-freshmen' has been difficult to obtain. It is not an easily identifiable category at Langston. Efforts will be on-going in order to obtain this information.

ADDITIONAL DATA AND TRACKING:

Internal assessments of colloquiums are established. Teacher observations and student assessment forms are completed.

Assessments were done for the trial colloquium as well as for each SI session.

External Evaluation is in place. Dr. Rosemary Hayes, Director of The Center for Institutional Data Exchange and Analysis at the University of Oklahoma has been retained. She will complete a Planning Evaluation during the Summer, 2004 period, and an appropriate evaluation for each year thereafter.

OTHER SALIENT POINTS:

LINC program output: 5 seniors were among 26 LINC scholars. 4 graduated Summa cum laude. 3 have been accepted into a Ph.D. program for the fall 2004 term. 2 have selected STEM careers.

- (1). Project (LINC) steering committee (TEAM) selected and operational
- (2). Supplemental TEAM members appointed
- (3). LINC Advisory Committee (PAC) selected and operational
- (4). LINC web site developed and online: <http://www.lunet.edu/linc/>
- (5). LINC brochure developed and distributed

Collaborative agreements for scholarships, research internships, recruiting, and curriculum enhancements have been put in place with over 15 statewide and university entities.

Findings:

1. Describe major findings resulting from these activities.
(Barriers, with anticipated solutions)

Although LINC is on target with most of its activities, we did experience some hiccups along the way, as summarized below:

(a) Budget

LINC will be slightly under budget at the close of its first fiscal year due to successful collaborative leveraging of monies budgeted for participant stipends. Less than half of allowed budget allocated for scholarships in year one will be spent at the close of our Spring 2004 term.

However, budgetary allowances are managed to account for possibility of greater financial impact of scholarships in subsequent school terms. We are anticipating a spike in per student funding in year two LINC students who are also HONORS scholars must maintain a 3.5 g.p.a. in order to remain qualified for their HONORS stipend. Should they fall below 3.5 (down to 3.0) LINC may have to assume a greater portion of scholarship funding.

We anticipate that this anomaly will be corrected, as excess stipend budget will be utilized to increase the number of LINC participants for 2004-fall semester.

(b) SEIS Data

LINC's baseline data for category 'pre-freshmen' is difficult to obtain, as it is not an easily identifiable category at Langston. Efforts will be on-going to obtain this information.

Use of SMART tracking data collection referenced in NSF proposal has been set aside in lieu of SEIS tracking system. It is not practical to support both systems, and the NSF has specifically requested use of SEIS.

Negotiations with SEIS to get desired data tracks not currently incorporated will be ongoing.

(c) Research Equipment Acquisition

While acquisition of equipment is on schedule, an inordinate amount of time was required to scrutinize and assess the many proposed choices by numerous vendors presented during the lengthy open bid process.

No further action is required.

(d) Curriculum Enhancement

The number of course -enhancement colloquiums outlined in the proposal appears to have been too aggressive for Langston's resources (8 for each of the five participating departments). Preliminary data from the trial colloquium suggest a two-hour minimum for each course. This makes the proposed number of courses very challenging to implement.

After final assessment data is analyzed, a more cautious approach of implementation of these courses may be called for. The departments

(chemistry, biology & mathematics) that contain the gate-keeping courses (as suggested by NSF) will be the initial focus.

Supplementary Instruction (SI) efforts experienced the usual 'first-time' hurdles to overcome, such as: (1) making sure that the student SI Leaders adhered to the teaching techniques, (2) the need to increase of the class enrollment in order to maintain a sufficient number of participants, (3) making sure that the assigned faculty mentors met frequently with the SI Leaders, and (4) making sure that both parties adhered to their respective Mentor-Leader Manuals. Many of the issues will become less of a barrier for LINC students; attends to all functions is mandatory to maintain scholarship. No further action necessary, except as noted.

Evaluation: Development and Planning Evaluation Plan

One of the start-up activities that we believe to be important to the success of this project is the refinement and implementation of our evaluation plan. To assist us with this effort, LINC is consulting with a researcher from the University of Oklahoma who has experience in project evaluation and specific experience in STEM projects. Rosemary Hayes, Director of The Center for Institutional Data Exchange and Analysis at the University of Oklahoma, is willing to serve as Langston University's LINC Project Evaluator. Ms. Hayes has served as the LS-OKAMP project evaluator and was the PI on an NSF project which developed retention and graduation database on underserved STEM majors.

During the past year, as the foundation was being laid for full implementation of LINC this fall, long range and short range goals were identified. To ensure that all the key elements needed to successfully implement LINC in the next years of the project are in place (before the start of fall classes), we have requested that the Project Evaluator conduct a Development and Planning Evaluation. The purpose of the Development and Planning Evaluation is to identify the baseline status of the project. First, the Development and Planning Evaluation will review the degree to which this past year's activities have served the project's goals and built the foundation needed to move on to Year Two. Second, the review will examine the goals, objectives, activities and strategies that will address the problem identified in our grant application during years Two through Five. This external review will help ensure that there have been no major oversights in our planning and development process. In addition, the evaluation will also examine the performance indicators and data collection process for the upcoming years to ensure that they can adequately measure LINC's performance toward those goals.

The Project Evaluator will use interviews with the Project Director and key personnel, as well as reviews of submitted materials to gather information pertinent to these issues. In addition, SEIS data gathered during the past year and national STEM retention and graduation data collected by the Consortium for Student Retention Data Exchange at the University of Oklahoma will also be gathered to form a baseline of performance with regard to student achievement. The chief deliverable of this review will be a report that addresses the developmental work conducted in the first year of the project. In addition this foundational work will be reviewed in light of the Year Two through Year Five goals and objectives. As a result of this initial review the Project Evaluator will provide the Project Director with a checklist of issues that appear to have been addressed in the planning of the project and those issues that need further clarification. This will give us an opportunity to address any outstanding issues before the next phase of LINC. We expect to receive this report in July.

Because of the significance and complexity of this project, the evaluation component is very important. We want to be sure to identify strategies that are working and modify those that are not supporting our goals as soon as possible. Following the Development and Planning Evaluation we intend to implement an iterative evaluation plan that consists of formative evaluations at the conclusion of each semester that culminate in an annual review and a summative evaluation at the conclusion of the project. In this way we can monitor the progress of our project and identify key 'Lessons Learned' that may be useful to colleagues that wish to implement a version of the LINC model.

Training and Development:

3. Describe the opportunities for training and development provided by your project.

Training and development activities during first year of project:

Faculty Training and Development

Effective faculty is crucial to the success of all educational programs. LU is committed to support LINC by supporting faculty development and training as follows:

1. Technology in the Classroom Training

(A collaborative effort with Langston University)

LU's faculty training facility and staff provide In-Kind training for STEM faculty for technology in the classroom.

During the fall 2003 and spring 2004 sessions, over 15 STEM faculty have received training in Computer Technology Integration, Web CT, Web Design, egrade, Visualization Techniques, and Microsoft Programs. LINC has acquired a computer specialist and web master (Leander Johnson) to personally assist the STEM faculty in this and related endeavors.

STEM faculty will implement this leaning into its teaching methods during the Fall, 2004 term, and anticipate that they will enhance students' learning experiences.

2. Supplemental Instruction Training

(A collaboration between LINC and EPSCoR for Curriculum Enhancement)

SI is a program that focuses on historically difficult classes (e.g. Chemistry, Biology, Algebra, Calculus, etc.) and is active at 500 institutions across the US. The goals of SI are to improve student grades, reduce the attrition rate within those courses, and increase the graduation rates of students. It helps students master course content while they develop and integrate learning and study strategies.

In keeping with LINC's stated planned activity of implementing STEM course curriculum enhancements, it financed a SI training workshop on inquiry-based instruction facilitated by Dr. Kay Patterson of the University of Missouri-Kansas City. Attendees included 15 STEM faculty along with faculty from Physical Therapy, Education, and Nursing during January 12-13, 2004

3. Technical Assistance Proposal Writing Class

(LU Collaboration)

During February 26-27 2004, 6 STEM faculty attended a LU sponsored (via Whitehouse Initiative) Technical Assistance Proposal Writing class.

4. Career Development Workshop

(LU funded)

(Two) 2 STEM faculty attended a QEM /Career development workshop for grant writing in Washington D.C.

5. Mentor training.

LINC mentors are using the Mentor Manual developed by the Center for Academic Development for mentorship guidance. They were trained in its functions at the SI workshop.

6. Additional Training and Development

LU's commitment to faculty training & development is in progress. It sponsored STEM faculty attendance at the following:

National Association of Naturalist Meeting in Sweden
National Association of Neuroscience in New Orleans
National Mathematical Association annual meeting

Training and development of faculty is on schedule. Numbers of attendees are on target.

Student training and development activities are in the areas of a) serving as SI Facilitators, b) Mentoring during outreach activities, c) receiving guidance from faculty mentors, d) participating in research activities, and e) PDA training.

1. Supplementary Instruction (SI)

(A collaboration between LINC and EPSCoR for Curriculum Enhancement)

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Dr. S. Williams obtained supplemental funding from EPSCoR to support the implementation of SI instruction for the spring 2004 semester. A SI 'Train-the-Trainer' workshop was conducted for 10 LINC students by Doris Jones. Four (4) of the 10 LINC students who participated were funded by LINC and the other 6 students plus 6 faculty mentors were sponsored by EPSCoR.

During the spring 2004-semester, trained LINC students facilitated SI sessions for courses in algebra, general chemistry I, general chemistry II, biology I and Organic chemistry II.

2. Mentoring during outreach activities

LINC, in collaboration with Langston University, has a number of outreach forums wherein faculty and Scholars interact with the Oklahoma community in an effort to showcase the facility, LINC, and the value of pursuing STEM disciplines. Following is a list of major activities:

(a) Recruiting event:

LINC collaborates with LU's Department of Education to reach over 30 different high schools and 6,000 high school students throughout Oklahoma. LU's recruiters distribute LINC's brochure and application, which features a link to our website. LINC personnel attend High School Day activities.

(b) SURE-STEP summer 2004 bridge program for perspective STEM majors.

LINC staff will participate in this NSF-sponsored program by teaching Chemistry and Physical Science. LINC scholars will serve as mentors. Students who excel will be offered LINC scholarships for fall 2004 semester.

(c) TALENT SEARCH

TALENT SEARCH provides In-Kind services that include a bank of high-performing ACT-test participants (over 500) for consideration by LINC. It also provides use of its recruiting personnel and service-learning tutorial opportunities.

3. Guidance from Mentors

Although mentoring is embedded in special research programs, each LINC participant has been assigned a faculty mentor who is required to meet with assigned student bi-monthly. 9 mentors are assigned to 26 LINC scholars.

It is anticipated that mentoring relationships will uncover potential problems before they become real issues, and assist in finding solutions to them. As a result, LINC scholars are more likely to meet or exceed requirements of the program as well as remain in STEM disciplines.

Each STEM department recommends STEM candidates for LINC and assigns mentors. Participating departments include Biology, Chemistry, Agriculture, Technology, and Computer Science.

Note: plans are underway to assign mentors to all STEM majors.

4. Research

Student Research is one of LINC's strategies to improve the retention rate of STEM students. Through this experiential learning, students will be exposed to challenging and exciting applications of 'book learning.'

LINC has established a number of collaborations that provide these enriching experiences for LINC scholars. Specific arrangements are as follows:

(a) LINC-UBEP Summer internship (a Research Collaboration)

LINC will financially sponsor two STEM scholars to join a LU professor, Dr. Timothy McMahon, at the NASA Goddard Space Center in Greenbelt, MD for research activities during the 2004-summer term. Dr. Timothy McMahon will be working on the SWIFT Mission.

The LINC-UBEP Summer internship collaboration will financially sponsor 16 STEM scholars to work with 9 LU faculty in summer research activities.

Eleven (11) other LINC scholars obtained summer research internships from various programs. Two of these will be at NSF research centers.

All research projects are expected to culminate with an oral and poster presentation.

(b) STEM Instructional Laboratory

The Instructional laboratory has acquired appropriate equipment and will be operational during the summer 2004 session. Equipment includes: high performance Liquid Chromatography, Infra Red Spectrophotometer, UV Spectrophotometer, Gas Chromatograph.

This STEM Instructional Laboratory will be the base for introducing students to state-of-the-art laboratory equipment, and enhance tutoring and mentoring efforts. It will also enhance student interaction and laboratory skills development. It is anticipated that it will attract students who may be on the borderline of attending a larger university because of access to state-of-the-art facilities.

(c) Research Conferences and Presentations

(1) NSF convention

LINC supported 2 LINC scholar participants' attendance at a NSF national convention at North Carolina A & T during February 26-27, 2004. Each presented a poster presentation of respective research projects.

LINC Supported 12 STEM students' attendance at Beta Kappa Chi-NIS national convention March 24-28. Each student presented an oral or poster presentation.

(2) Research Day

Research day for undergraduate research papers was presented at the Oklahoma state capitol during March 2004. All schools in the state of Oklahoma were allowed to send a representative for the research competition. James Patterson, a LINC participant won 2nd place in this state-wide competition.

(3) The School of Arts & Sciences

The School of Arts & Sciences presented its annual Research Day in April 2004. 43 STEM majors presented their research projects either as an oral or poster presentation.

(4) PDA - Training

Students received training on the use of their PDAs in order to more effectively use them. Students have wireless access to the internet, managing schedules & commitments, vocabulary usages, WEBCT assignments, and wireless sharing of digital information between mentor-student & student-student.

Outreach Activities:

4. Describe outreach activities your project has undertaken.

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community in an effort to showcase the facility, LINC, and the value of pursuing STEM disciplines. Following is a list of major activities:

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TALENT SEARCH

TALENT SEARCH provides In-Kind services that include a bank of high-performing ACT-test participants for consideration by LINC. It also provides use of its recruiting personnel and service-learning tutorial opportunities. TALENT Search has collaborative programs with over 30 high schools throughout Oklahoma.

Journal Publications

Books or Other One-time Publications

Web/Internet Site

URL(s):

www.lunet.edu/linc

Description:

III. Publication and Products

What have you published as a result of this work?

1. Internet Dissemination

LINC is utilizing current technology to effectively and efficiently disseminate information about its offerings. Our site is online at www.lunet.edu/linc. From the site, Internet visitors can learn about LINC's program and philosophy, as well as access its application and brochure. A calendar of events keeps interested parties advised of upcoming special events.

Hardcopies of the brochure and application are also available at Langston's recruiting office and placed strategically throughout the university's physical facility. They were mailed to target high schools and organizations throughout Oklahoma.

Other Specific Products

Contributions

Contributions within Discipline:

Contributions to Other Disciplines:

Contributions to Human Resource Development:

Contributions to Resources for Research and Education:

4. Contributions to Resources for Science and Technology:

STEM Instructional Laboratory

Dr. Douglas Chan will facilitate instruction.

The Instructional laboratory has acquired appropriate equipment and will be operational during the summer 2004 session. Equipment includes: HPLC (high performance Liquid Chromatography), Infra Red Spectrophotometer, UV Spectrophotometer, Gas Chromatograph.

This STEM Instructional Laboratory will be the base for introducing students to state-of-the-art laboratory equipment, and enhance tutoring and mentoring efforts. It will also enhance student interaction and laboratory skills development. It is anticipated that it will attract students who may be on the borderline of attending a larger university because of access to state-of-the-art facilities.

While acquisition of equipment is on schedule, an inordinate amount of time was required to scrutinize and assess the many proposed choices by numerous vendors presented during the lengthy open bid process.

Contributions Beyond Science and Engineering:

Special Requirements

Special reporting requirements: None

Change in Objectives or Scope: None

Unobligated funds: less than 20 percent of current funds

Animal, Human Subjects, Biohazards: None

Categories for which nothing is reported:

Organizational Partners

Any Journal

Any Book

Any Product

Contributions: To Any within Discipline

Contributions: To Any Other Disciplines

Contributions: To Any Human Resource Development

Contributions: To Any Beyond Science and Engineering