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(Form 1-ENH, Rev. 2007)

PROJECT SUMMARY

Name of Institution (Include Branch/Campus and School or Division)

**NORTHWESTERN STATE UNIVERSITY OF LOUISIANA
NATCHITOCHES – COLLEGE OF SCIENCE AND TECHNOLOGY**

Address (Include Department)

**DEPARTMENT OF MATHEMATICS
NORTHWESTERN STATE UNIVERSITY
NATCHITOCHES, LA 71497**

Principal Investigator(s)

Dr. Leigh Ann Myers, Mrs. Elizabeth Cole, Dr. Mary Reeves, Dr. Eric Fountain, Mrs. Roxanne Lane

Title of Project

MATHEMATICS EXPERIENCES LABORATORY

Abstract (DO NOT EXCEED 250 WORDS)*

The Department of Mathematics at Northwestern is a service department for the University. As such, it is the responsibility of the department to serve the mathematical needs of students from varying curricula which require these support courses. Research into mathematical learning clearly demonstrates that for students to develop independent problem-solving skills, they must have opportunities to engage in genuine problem-solving activities under the guidance and supervision of a qualified teacher.

With an overreaching vision to increase student engagement in and mastery of the fundamental ideas of problem-solving and addressing the recently released MAA/CUPM CRAFTY guidelines, we hope to accomplish the following two goals during the 2008-2009 academic year.

- Goal 1: The Department of Mathematics at Northwestern State University seeks to furnish and equip a mathematics experiences laboratory to serve our College Algebra, Trigonometry, and Precalculus courses.
- Goal 2: The Department of Mathematics at Northwestern State University seeks to prepare a collection of classroom materials that will aid faculty in incorporating hands-on experiences in College Algebra, Trigonometry, and Precalculus.
- Goal 3: The Department of Mathematics at Northwestern State University seeks to implement hands-on laboratory experiences in every College Algebra, Trigonometry, and Precalculus class on the Natchitoches campus and at least 50% of our satellite locations.

To accomplish these goals, we are requesting monetary support for the purchase of laboratory equipment, stipends for participants in instructor workshops, and for the support of principal investigators and other project personnel in creating classroom materials to be used in the hands-on laboratory.

(Form 2, rev. 2007)

MATHEMATICS EXPERIENCES LABORATORY

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NARRATIVE AND BIBLIOGRAPHY

a. THE CURRENT SITUATION

a.1 Institutional Description

Northwestern State University of Louisiana is a four-year, state-supported, comprehensive institution serving the area of Northwest and Central Louisiana. Its service area includes a population of approximately 400,000, characterized by rural poverty, high unemployment and welfare, high ratios of under-served and disadvantaged citizens, and low taxation capacity. The area is isolated from major industry, transportation, and the educational mainstream. The main campus of Northwestern State University is located in the city of Natchitoches, Louisiana. The spring 2007 enrollment at Northwestern was 8694, of whom approximately 99 percent are undergraduates, 70 percent female, 28 percent African-American, and 39 percent age 25 or older. Northwestern serves a wide, rural area.

The Department of Mathematics is primarily a service department as are other mathematics departments at colleges and universities in Louisiana. Data taken from the Board of Regents' website indicates that as of the spring of 2007, there are 64,182 undergraduate students enrolled in colleges and universities in the University of Louisiana System. Of these students, only 189 are declared mathematics or statistics majors. At Northwestern, we currently support 19 declared mathematics majors. All faculty in the Department of Mathematics at Northwestern State University regularly teach courses for students who are not mathematics majors, including some full-time faculty who teach these courses exclusively. For all faculty, successful student learning is critically important in all courses. The faculty of the department consists of 18 full-time faculty. The Department values excellence in teaching very highly in terms of hiring, retention, and promotion of faculty.

a.2 Rationale for Project

Concern about student learning in College Algebra courses is at an all-time high. According to such professional organizations as the Mathematical Association of America (MAA) and American Mathematical Association of Two Year Colleges (AMATYC), there are a number of reasons for this concern, including the fact that "nationwide more than 45% of students enrolled in College Algebra either withdraw or receive a grade of D or F" (Haver, et al., 2007, p. 34). As the report *Algebra: Gateway to a Technological Future* (Katz, 2007), published by the MAA and funded by the National Science Foundation, makes clear, demand for College Algebra courses that focus more on mathematical problem solving and algebraic modeling is increasing, while traditional College Algebra courses focus on manipulation in isolation from application contexts. In the few instances where exemplary materials have been developed and put into use, student achievement and attitudes about mathematics have improved substantially (Haver). The Department of Mathematics at Northwestern is a service department for the University community. As such, it is the responsibility of the department to serve the mathematical needs of students from varying curricula which require these support courses.

Research into mathematical learning clearly demonstrates that if students are to develop independent problem-solving skills then they must have opportunities to engage in genuine problem-solving activities under the guidance and supervision of a qualified teacher. Faculty in the Department of Mathematics at Northwestern State University are open to these pedagogical strategies, and many are already engaging students in problem-solving experiences in individual

classes, on a smaller scale. This project seeks to expand upon these current initiatives, with broader implementation across all sections in the Department, and to develop classroom laboratory activities which are as content-rich as possible.

Many students enter Northwestern State University unprepared for college level mathematics and independent problem solving. These students often see mathematics as unrelated to the courses in their majors, and to the work they plan to do after graduation, and some of these students experience an excessive level of stress and frustration. Northwestern State University and the other universities in the University of Louisiana System (ULS) are strongly encouraged to retain a greater number of the entering students with the ultimate goal of giving Louisiana more college graduates in the workforce. The group of students suffering from frustration and anxiety in mathematics courses are high on the list of possible dropouts. Attaining a high level of teaching quality in the mathematics core courses is crucial to the retention of the students entering Northwestern State University who are weak in mathematics.

It is the mission of the Department of Mathematics at Northwestern State University to . . . *provide excellence in teaching to the NSU community through course offerings in the University core, mathematics and mathematics education curricula, and special requirements of other University departments. The Department is committed to remaining an established leader in using technology as a tool for learning and maintaining high standards in innovative teaching, research, and service* (from the mission statement of the Department of Mathematics at Northwestern State University).

This project, if funded, would help the department make great strides in meeting our mission as a department.

a.3 Impact on Existing Resources

The mathematics program at Northwestern is a technology rich environment. Students are required to have graphing calculator technology in all core education courses in mathematics, and currently, graphing calculators and/or computers are used regularly in almost all courses within the department. Each faculty member has a mobile presentation station, which includes an overhead projector and appropriate Viewscreens for presenting calculator displays to classes. Those projection devices and the graphing calculators currently in use will be used to help instructors link the experiences in the proposed mathematics laboratory with other classroom activities, hopefully expanding the students' views of the ways technology can help them solve problems. The students' and instructors' current calculators will also be used to input and analyze data collected in the mathematics laboratory for those activities that do not require technology-based data collection.

The Department of Mathematics at Northwestern State University has small classroom sets of older calculator-based data collection technology, including a variety of probes, which are available for loan to secondary mathematics teachers in our service area. While this equipment loan program serves to strengthen our connection to local mathematics classrooms, and enriches the educational opportunities in those classrooms, it reduces the availability of the equipment for use in University classes. Some sections of Trigonometry and Precalculus have been able to use the current equipment for large group projects, but the department does not have enough of the older data collection devices to effectively serve classes like College Algebra, which can have as many as 60 students per section. The equipment currently on hand will continue to be offered for loan to area schools, while the new equipment purchased through this proposal will be able to more adequately serve classes at NSU.

b. THE ENHANCEMENT PLAN

b.1 Project Goals and Objectives

With an overreaching vision to increase student engagement in and mastery of the fundamental ideas of problem solving and addressing the recently released guidelines from the Mathematical Association of America CUPM Subcommittee on Curriculum Renewal Across the First Two Years, we hope to accomplish the following goals during the upcoming academic year.

Goal 1: The Department of Mathematics at Northwestern State University seeks to furnish and equip a mathematics experiences laboratory to serve our College Algebra, Trigonometry, and Precalculus courses.

Goal 2: The Department of Mathematics at Northwestern State University seeks to prepare a collection of classroom materials that will aid faculty in incorporating hands-on experiences in College Algebra, Trigonometry, and Precalculus.

Goal 3: The Department of Mathematics at Northwestern State University seeks to implement hands-on laboratory experiences in every College Algebra, Trigonometry, and Precalculus class on the Natchitoches campus and at least 50% of our satellite locations.

To accomplish these goals, we are requesting monetary support for the purchase of laboratory equipment, stipends for participants in instructor workshops, and for the support of principal investigators and other project personnel in creating classroom materials to be used in the hands-on laboratory. In order to meet the goals above we propose the following objectives:

Objectives for Goal 1:

- (1.1) Northwestern State University will renovate a classroom within the Department of Mathematics to allow for space for up to 60 students to work in laboratory groups.
- (1.2) Northwestern State University will purchase and install tables and chairs appropriate for mathematics laboratory experiences in the designated classroom.
- (1.3) The project team will purchase computers and presentation equipment for the designated classroom to allow instructors and students to demonstrate and share laboratory results.
- (1.4) The project team will purchase Vernier LabQuest data collection devices, associated data collection probes, and student/teacher calculator interfaces for laboratories involving technology-based data collection.
- (1.5) The project team will purchase manipulatives and other equipment required for laboratories involving non-technology based data collection.

Objectives for Goal 2:

- (2.1) The project team will create laboratory instructions to allow teachers to implement hands-on mathematics activities and help students make connections among various types of mathematical models, their personal experiences, and their studies in other disciplines.
- (2.2) The project team will create laboratory report templates that will assist students in organizing results of data collection, analyzing data, and writing reports summarizing the results of mathematics laboratories.
- (2.3) The project team will compile and publish a laboratory book consisting of instructions and student report templates for laboratories appropriate for use in College Algebra, Trigonometry, and Precalculus.

Objectives for Goal 3:

- (3.1) The project team will train mathematics faculty of Northwestern State University, including satellite campus faculty, regarding the use of equipment involved in the

technology-based data collection activities and suggestions for inclusion of hands-on activities in precalculus mathematics courses.

- (3.2) Faculty in the Department of Mathematics on the Natchitoches campus will include at least two hands-on experiences for students in each College Algebra, Trigonometry, and Precalculus section during the spring 2009 semester.
- (3.3) Faculty in the Department of Mathematics on satellite campuses will borrow equipment to implement at least two hands-on experiences in College Algebra sections during the Spring 2009 semester.

b.2 Work Plan of the Proposed Project

In order to achieve the goals and objectives described above, the project team has outlined a plan of work that will begin in June 2008 and extend through June 2009 and beyond. The major steps in that work plan are given in detail below, including the project team member(s) who will conduct each activity and benchmarks with which we plan to measure achievement of the stated objectives. The proposed project will begin during the summer of 2008 with renovation of the designated mathematics laboratory classroom and purchase of necessary equipment, continue throughout the 2008-2009 academic year with development and testing of laboratory materials, and conclude with implementation of hands-on laboratory experiences in all College Algebra, Trigonometry, and Precalculus classes in the spring and fall of 2009.

The initial phase of the proposed project will be threefold – including the construction needed to renovate the mathematics laboratory classroom, ordering of equipment for the classroom and hands-on lab activities, and creation of instructor and student materials for the activities. All three of these activities will begin as soon as funding is available. The project team will divide the duties involved in these initial activities so that they can be completed in a timely manner; the first two activities will involve the help of the staff of the NSU physical plant, information systems, and business affairs offices.

Initial approvals and renovation estimates for the classroom have already been obtained, and the funding for that construction is in the form of in-cash match from Northwestern State University, so the initial phases of construction can begin as soon as the University receives funding for the project. Dr. Eric Fountain will assume primary responsibility for coordinating the renovation of the laboratory classroom area with workers from the NSU physical plant office. The renovation will include removing a wall that currently divides a small classroom and a large storage area, moving a wall between those two areas and the current mathematics tutoring lab, and installing the electrical and computer network wiring needed for both the renovated classroom and the tutoring lab. All renovations will be completed by the NSU physical plant employees or contracted wiring companies, with expected completion in August, 2008.

The equipment, both technology-based and non-technology-based, that will enable us to include hands-on laboratories in all College Algebra, Trigonometry, and Precalculus classes, will be ordered as soon as the facilities are ready. Dr. Leigh Ann Myers will assume primary responsibility for ordering the equipment needed. Orders for the data collection devices, probes, and other hands-on laboratory equipment described in detail in part c. of this proposal, which will be stored in an existing storage room within the renovated classroom, can be made during the early summer of 2008 so that the equipment will be available for use in creating the instructor and student materials and in-class testing of the hands-on activities during fall 2008. Computers,

the projector, screen, and presentation station for the renovated laboratory will be ordered and installed as soon as renovation is completed and the necessary desks are in place.

Initial compilation of activities that are appropriate for use in the courses this project addresses and that will help students make connections among various topics in mathematics, topics in other coursework, and their personal experiences has already been completed. Some of the activities this project will include are: height of bouncing balls (quadratic and exponential functions), Newton's law of heating and cooling (exponential functions), Hook's law (linear function and proportion), and estimating heights using shadows or clinometers (proportional reasoning and/or trigonometric functions). While the basic activities have been chosen, this project will focus on creating a set of widely usable instructor and student materials for those activities. Mrs. Beth Cole will assume primary responsibility for creation of the instructor materials, while Dr. Mary Reeves will assume primary responsibility for creation of the student report templates. Those two members of the project team will work together with Mrs. Roxanne Lane to compile a final list of activities to be piloted in their classes during the fall of 2008.

An initial version of the instructor and student materials for at least six hands-on activities will be completed during the summer of 2008. All members of the project team will work together to produce those classroom materials. Voluntary class testing of those activities, as well as writing of materials for at least four more activities and revision of the original materials, will be completed during the fall semester of 2008. The class testing will occur as soon as the laboratory facilities are ready or may be conducted in the regular classrooms if appropriate. Once class testing is completed, the materials will be revised as appropriate for inclusion in the department-wide implementation of hands-on activities in the focused courses. As is noted in the schedule below, further revision of the laboratory materials is planned for summer 2009, after campus wide implementation of the hands-on activities.

In order to fully implement the hands-on activities in the courses outlined in the project goals, faculty who teach those courses must be trained in the use of new technology and given suggestions for effective inclusion of such activities in the traditionally lecture-based courses. Dr. Eric Fountain will assume primary responsibility for arranging a training session for NSU mathematics faculty to be held in January 2009. All members of the project team will assist in demonstrating the laboratory activities during this one- to two-day training session which will include working through the created laboratory activities, instructions for using the purchased equipment, and suggestions for helping students engage in the activities in meaningful ways. The group will discuss appropriate timing for inserting the various activities into the existing course curricula. Instructors from Northwestern State University's satellite campuses will also be given instructions for borrowing the needed equipment in order to implement the hands-on activities in off-campus environments.

Interested on-campus faculty who require minimal training will be given the opportunity to join the project team in voluntary implementation of the hands-on activities during the fall semester of 2008, but full implementation of the activities throughout all sections of College Algebra, Trigonometry, and Precalculus will happen after the initial training session and during the spring semester of 2009. During this first semester of implementation, members of the project team will be available to assist other faculty members in preparing for and using the activities as part of the designated courses, with Dr. Eric Fountain assuming primary responsibility for coordinating cooperation between team members and faculty requesting assistance and Mrs. Roxanne Lane acting as faculty implementation mentor. Data will be

gathered from all faculty members regarding student performance on problems related to the laboratory activities. That data will be compared to historical data collected in the fall 2007 and spring 2008 semesters. Dr. Fountain will lead in the collection of that data as well as development of other assessment instruments regarding student and instructor satisfaction with the laboratory materials.

A follow-up workshop for feedback to the project team as well as further training will be held in May 2009. Other college faculty from throughout the state will be invited to attend this dissemination workshop as well so that we can share our work and receive feedback from a larger group of college faculty. During this two-day session, NSU faculty who have used the classroom materials for hands-on labs in College Algebra will share with the project team and with other interested colleagues the results of this innovative approach to teaching at the college level. Feedback from other NSU mathematics faculty as well as colleagues from throughout the state regarding the ease of use of the created activities will drive the final revisions of the materials described above. Once final revisions of the laboratory activities are completed in June 2009, a laboratory manual will be published for use in future years.

A summary of the major benchmarks by which we will judge successful completion of the project is given in the table below.

Objective	Benchmark	Completion Time
1.1	Removal of existing walls	June 2008
	Construction of new walls for laboratory with wiring	August 2008
1.4, 1.5	Purchase of data collection equipment	August 2008
1.2	Purchase of Tables, Chairs, Storage Boxes	September 2008
1.3	Purchase of Classroom Computer Hardware	September 2008
2.1, 2.2	Lab instructions, student report templates for 6 activities	September 2008
	Lab instructions, student report templates next 4 activities	November 2008
	Revision 1 of Lab Instructions, Student Report Templates	January 2009
	Revision 2 of Lab Instructions, Student Report Templates	June 2009
2.3	Publication of Mathematics Experiences Laboratory Manual	June 2009
3.1	Train NSU Faculty from all campuses	January 2009
	Feedback from and further training for NSU faculty and seminar for other colleagues	May 2009
3.2, 3.3	Initial voluntary testing of Hands-on Activities in Courses	December 2008
	Full testing of Hands-on Activities in Courses	May 2009

b.3 Evidence of Potential to Achieve Recognized Eminence

Northwestern State University is recognized throughout the state and region as an institution that is responsive to the needs of its students. This reputation is built upon Northwestern's willingness to embrace innovation and can be seen in the pervasive use of technology to serve the needs of traditional and nontraditional students at the main campus, satellite campuses, and online. For over 117 years, Northwestern State University has met the educational needs of students through quality academic programming. The Department of Mathematics is well-known throughout the region for its commitment to quality instruction and its willingness to seek innovative approaches to further its commitment to meeting the educational needs of all students. The proposed project will provide the Department of

Mathematics of Northwestern State University with the equipment necessary to establish a teaching laboratory that will facilitate the development of innovative techniques and materials to enhance mathematics education.

In addition to its commitment to provide a high-quality program in mathematics for its majors, the Department of Mathematics embraces its role in providing high-quality, degree-appropriate mathematics instruction for all students at Northwestern State University. The Faculty in the Department of Mathematics is committed to improving the delivery and content of mathematics instruction. This project will build on that commitment by facilitating the development and dissemination of effective activities and materials to enhance mathematical learning in College Algebra, Trigonometry, and Precalculus courses. Having a dedicated lab will advance this effort by providing a controlled environment in which to assess the effectiveness of the materials and activities designed by project faculty. Through successful testing and implementation of the project materials and activities, Northwestern State University and the state of Louisiana will have the opportunity to gain national recognition for cutting-edge mathematics education.

The activities and materials developed in the mathematics lab funded by the proposed project will have broad application in mathematics departments at colleges and universities across the state, region, and nation. At the present time, there is considerable national interest in improving teaching and learning in College Algebra. Professional organizations including the National Council of Teachers of Mathematics (NCTM), the American Mathematical Association of Two-Year Colleges (AMATYC), the Mathematical Association of America (MAA), the National Academy of Sciences (NAS), and the National Science Foundation (NSF) have identified improving instruction and learning mathematics and science at all levels as a critical national need and a matter of national and economic security. Presently, there is a great deal of room for institutions of all sizes and student population demographics to collect and disseminate evidence-based research findings related to student learning and progress in mathematics courses. Far too little is known and too many questions remain unanswered, especially in regard to general education mathematics courses for non-mathematics or science majors.

Nevertheless, students from this population make up the vast majority of students seeking credits in Departments of Mathematics at institutions across the country. Presently, textbook representatives and sales personnel are touting the possibilities offered by computer-based tutorials and homework programs, which undoubtedly improve students' algebraic manipulation skills substantially in the short term. However, granting that such short-term gains are real does not address the concerns from leaders in business and industry for employees who possess the mathematical, logical, and communication skills that are necessary for the United States to remain a vibrant participant in the world economy, nor does it consider the position taken by professional organizations in mathematics that realistic mathematical modeling is a more significant purpose of College Algebra than mere algebraic dexterity. As the recent report of the MAA, *Algebra: Gateway to a Technological Future* (2007), makes clear:

The curriculum committees of both AMATYC and MAA, basing their ideas on what has been learned in recent years about college algebra through NSF support, have called for replacing the current college algebra course with one in which students address problems represented as real world situations by creating and interpreting mathematical models. There have been several studies of the effect of college algebra courses designed to meet the new MAA and AMATYC guidelines,

with very positive results. Nevertheless, it is important that there also be [additional] studies of student learning in the refocused college algebra courses. (Katz, 2007, p. 3)

By providing a laboratory where techniques for engaging college algebra students in problem-solving activities can be developed, valid and reliable data can be collected and analyzed, and findings refined for dissemination through workshops, conference presentations, and journal articles, this project has enormous potential to enhance the eminence of the Department of Mathematics at Northwestern State University in the state, regional, and national arenas.

b.4 Impact on Curriculum and Instruction

“Students are more likely to want to learn when they appreciate the value of classroom activities and when they believe they will succeed if they apply reasonable effort,” according to Jere Brophy in “Synthesis of Research on Strategies for Motivating Students to Learn” (*Educational Leadership* v.45 n2 p 40-48, October 1987, Page 42). This project seeks to enhance our mathematics support courses so that these courses are consistent in content and in timing with student needs in their non-mathematics courses. Changes in curricula that lead to increased learning of appropriate content help students to place higher value on the subject content, increase commitment to the learning process, and deepen understandings of the importance of mathematics as a support mechanism for non-mathematics courses.

The process of changing curriculum appropriately begins by evaluating the mathematical needs of students in their non-mathematics courses. Increased perception of the usefulness and applicability of mathematics will result in both improved instruction and effective learning. Students are more likely to complete their studies when instruction is improved, learning is enhanced, and content is perceived as applicable across disciplines. This project should help increase retention of students and improve their persistence toward completion of their degree program.

The development of laboratory activities that are utilized in all sections of the course will also provide all students with a common basis for study and discussion. These common experiences provide students with a greater sense of cooperation and consistency across instructors, increasing the confidence of students in their own instructor and in the department as a whole.

b.5 Impact on Quality of Students

The enrollment at Northwestern State University has decreased slightly with the instigation of selective admissions at the University, but average ACT scores of entering first-year students have increased. With increased numbers of better students comes increased demand by those students for quality instruction. The commitment of mathematics faculty involved in this project to providing a quality learning experience to increasingly higher quality students will result in current students telling prospective students about their learning experiences. One of the most efficient ways to attract and retain high-quality students is by assuring that currently enrolled high-quality students have a positive, valued learning experience. Committed, high-quality students want to attend a university with a demonstrated commitment to providing the best educational experiences possible. They want to attend a university where the faculty is demonstrably interested in facilitating their learning process. They want to be a part of a university that is willing to change, if that change is for the better.

Clearly, asking faculty to make substantial changes to the form of instruction in their classes requires a commitment of time and effort on the part of each faculty member. It would be easier to take the approach that we will teach what we choose to teach, at the time we choose to teach it, in the manner each of us deems most appropriate, without regard to student needs. Our willingness to learn and remain flexible in what we teach, when we teach it, and how we teach it is one of the commitments that Northwestern State University has made to our current and future students. This commitment results in attracting and retaining quality students to the University. This project will provide an additional recruiting tool to the department and the University as we seek to continue to attract and retain high-quality students to our various programs.

b.6 Impact on Faculty Development

Northwestern State University mathematics faculty members have an ongoing commitment to learning. This project builds a structure for faculty development that allows each participating faculty member to increase his/her knowledge about teaching mathematics and how mathematics is applied, and to contribute her/his own experiences with mathematical applications in the development of laboratory activities. Because students will see the faculty members incorporating hands-on, small group activities into lessons and connecting those activities to algebraic content knowledge, faculty will gain increased credibility with students who may be skeptical initially about the usefulness of mathematics in their university career.

Another goal of this project is to positively impact the image of mathematics instruction within the University community. The Northwestern State University Department of Mathematics has an outstanding record of achievement in developing and presenting innovative programs of mathematics instruction designed to positively impact teaching and learning of mathematics at all educational levels. This project adds another innovative process and approach to teaching that will positively impact mathematics instruction at all levels. There is no reason to expect that the laboratory activities that are the end result of this project will not be applicable to other settings, and therefore of interest to mathematics colleagues at a variety of institutions, both within Louisiana and across the country. We expect this innovative approach to understanding what and when we teach will have positive impact on improving mathematics instruction throughout our region and throughout the state, and fully expect project staff to make professional presentations of our results and to submit papers about the project to appropriate professional journals.

b.7 Performance Measures

When beginning any project, it is vital that the project personnel know how to determine if the project has been successful. For this project, success will be determined by the availability of the indicated equipment, in an appropriate physical setting, which means that the mathematics education laboratory will exist in a classroom remodeled specifically for this purpose. Additionally, success will entail not merely the existence of this facility, but also the use of this laboratory by all faculty teaching College Algebra each semester. Data will be gathered concerning the number of times each section of the targeted courses uses the laboratory during the spring 2009 semester and beyond. Data regarding student attitudes and success in the included courses will also be compared to historical data.

c. EQUIPMENT

c.1 Equipment Request

Equipment for this project can be divided into four groups – LabQuest-based data collection equipment, hands-on equipment, hardware/software, and storage and security. Equipment in each group is listed and the reason for selection of these particular items follows.

Item	Qty.	Unit Cost	Total Cost
Vernier LabQuest	60	\$299	\$17,940
Motion Detector	50	\$75	\$3,750
Dual Range Force Sensor	50	\$109	\$5,450
Microphone	5	\$37	\$185
Temperature Probe	50	\$29	\$1,450
pH Sensor	10	\$78	\$780
Light Sensor	50	\$12	\$600
Total for LabQuest Based Data Collection Equipment			\$30,155

Two classroom sets (30 each) of the Vernier LabQuest data collection units plus additional probes are requested. One set will be used for the Natchitoches campus and the other will be available to travel to satellite campuses. The new LabQuest data collection devices are the latest technology available and include such features as color and touch screen capabilities. The previous generation probes are still compatible with these new devices. Only the quantities needed to complete the classroom sets are requested. Those probes needed for Trigonometry and Precalculus only are requested in reduced amounts due to lower enrollments in these sections. Labs utilizing each of these probes to collect real life data will be developed and included in the laboratory manual that is proposed. Having the ability to create laboratory experiences for College Algebra, Trigonometry, and Precalculus courses will not only provided students with real-life experience collecting and analyzing data, but give instructors the ability to enhance the classroom experience and develop a cutting-edge course curriculum.

Item	Qty.	Unit Cost	Total Cost
Clinometers	9	\$20	\$180
100' tape measure	6	\$17	\$102
Trundle Wheel (metric)	6	\$30	\$180
Bouncing Ball	60	\$1	\$60
Tuning Forks	15	\$10	\$150
Ring Stands	30	\$11	\$330
Rings with Clamps	30	\$3	\$90
100 ml Beakers	15	\$2	\$30
Weight Sets	60	\$10	\$600
Scissors	60	\$3	\$180
TI-Navigator Classroom Set	1	\$3,995	\$3,995
Total for Hands-on Equipment			\$5,897

The hands-on equipment requested is necessary for use with the LabQuest data collection units and for labs that use only the TI graphing calculators. Each of these items will be incorporated into laboratory experiences for College Algebra, Trigonometry, and Precalculus

students. The TI-Navigator set will allow the instructor to connect student calculators together simultaneously and share data as well as collect data from the students. This technology will allow the class to examine data both individually and collectively.

Item	Qty.	Unit Cost	Total Cost
Computers	4	\$1,100.05	\$4,400.20
Document Camera	1	\$2,546.00	\$2,546.00
SmartBoard Presentation Package (Details Below)	1	\$19,500.00	\$19,500.00
Printer	1	\$750.00	\$750.00
Total for Hardware/Software			\$27,196.20

The Mathematics Experiences Laboratory will be equipped with a computer, document camera, and SmartBoard with presentation package to create a more interactive laboratory experience. This equipment will allow the instructor to collect and store data and post the lab results online for student review. The SmartBoard Presentation Package includes the interactive board, a ceiling mounted projector, speakers, interactive SmartSenteo student handheld units, and installation of all equipment. Students will be able to interact with the SmartBoard technology through the use of handheld devices. A presentation station is included in the SmartBoard package to house the equipment for use with the SmartBoard, including one computer and document camera. Three additional computers and a printer will be housed in the lab for student use. Students will be able to download and print lab reports and results with this equipment without removing LabQuest devices from the room.

Item	Qty.	Unit Cost	Total Cost
Plastic Storage Bins	14	\$5.00	\$70
Case for LabQuests	2	\$102.00	\$204
Electronic Door Lock	1	\$1,000.00	\$1,000
Extra Fob Keys for Lock	10	\$7.50	\$75
Computer Desks	3	\$1,000.00	\$3,000
Total for Storage and Security			\$4,349

Plastic storage bins and cases will be used to safely store hands-on equipment and LabQuest data collection units. This will allow us not only safe storage but also safe transportation for use on our remote campuses. Computer desks are requested for the three computers requested for student use in the lab. An electronic door lock compatible with the Department of Mathematics' high security lab locks with additional key fobs for faculty is necessary for securing the room and the equipment.

c.2 Equipment on Hand for Project

Currently the Department of Mathematics has the following equipment available for use in the Mathematics Enhancement Laboratory:

Item	Qty.
Vernier Motion Detectors	10
Vernier Microphone	10
Vernier pH sensors	5
Clinometers	6
Trundle Wheel (metric)	2

Item	Qty.
Vernier Dual Range Force	10
Vernier Temperature Probe	10
Vernier Light Sensor	10
100' Tape Measures	1
Geoboards	30

These items will be used in conjunction with the requested items to produce two classroom sets of 30 for College Algebra classes and one classroom set of 15 for Trigonometry and Precalculus classes. Each of these items will be used in the implementation of the laboratory experiences.

c.3 Equipment Housing and Maintenance

All equipment will be housed in Kyser Hall rooms 401A and 401B. Room 401A will be the lab classroom and will contain the presentation station with computer equipment, the SmartBoard, the projector, the student computers and printer with desks, and the TI-Navigator. The SmartBoard will be wall mounted and the projector ceiling mounted. Within 401A is a storage room 401B. Room 401B will house LabQuest collection devices, all probes and sensors, and all hands-on equipment and will be secured with a key lock compatible with the office doors for the Department of Mathematics. Room 401A, which also contains the access to 401B, will be secured with an electronic door lock compatible with the current high security locking system of the department's computer labs. The computers purchased will include a three-year-on-site warranty agreement. The department's network administrator will perform any required maintenance on all equipment. A fee currently assessed on students enrolled in mathematics classes will pay for this maintenance and any repair expenses required. Use of the LabQuest collection devices, probes and sensors, and hands-on equipment will be extended to our satellite campuses. The equipment will be packed in storage bins and cases and shipped via the Northwestern campus messenger system to insure security and safety of the equipment.

d. FACULTY AND STAFF EXPERTISE

The entire faculty in the Department of Mathematics at Northwestern has experience teaching the core courses in mathematics. All faculty teach with the use of graphing calculators in the classroom. Since we require a graphing calculator of every student, we use calculators on a daily basis and are aware of the changes in teaching methods that are needed to make technology an effective tool in the teaching of mathematics. Many of our faculty also incorporate electronic supplements to reinforce mathematical skills. The project directors, Dr. Leigh Ann Myers, Mrs. Elizabeth Cole, Dr. Mary Reeves, Dr. Eric Fountain, and Mrs. Roxanne Lane, are among the leaders in the department's endeavor to improve the mathematical preparation of all students at Northwestern. Dr. Myers will oversee all aspects of the project. The co-project directors will all participate in the creation of course materials for use in the hands-on mathematics laboratories. Specific duties will be assigned as described in section b.2 of this proposal and in accordance with the various expertise and experiences each of the members of the project team possesses. The varied backgrounds and experiences of the project team described below will ensure that every aspect of the project can be completed as proposed.

Dr. Myers has directed several successful grant programs, including LaSIP mathematics professional development for area teachers as well as grants that funded technology upgrades for the Department of Mathematics. She plays the lead role in the department with advising colleagues on the use of computer software and hardware. She teaches most of her math classes with graphing technology and has presented Calculator Based Laboratory activities to in-service teachers and small groups of students. Dr. Myers has participated in nationwide programs dedicated to the improvement of mathematics teaching. She has directed projects, made presentations, and published papers that shared Northwestern's technology successes with other universities throughout the region and nation. Dr. Myers' teaching responsibilities have included

College Algebra, Trigonometry, Precalculus, and Survey of Calculus as well as upper level mathematics courses.

Mrs. Cole is the Department of Mathematics' resident expert in statistics. She has conducted surveys for the department in the effectiveness of current support courses. As such, she brings with her first-hand knowledge of the needs of the various University programs as well as expertise in conducting and evaluating follow-up surveys for the project components. Mrs. Cole also brings expertise in the area of instructional technology. She completed her specialists' degree in educational administration with an emphasis in instructional technology. Mrs. Cole's teaching responsibilities have included the elementary statistics course, the senior level statistics course, College Algebra, Finite Mathematics, Trigonometry, Precalculus, Survey of Calculus, and Introduction to Basic Mathematics. She designed and teaches both the Mathematics of Statistics and Trigonometry courses online. Each of the classes she teaches utilizes the graphing calculator and an electronic supplement, usually offered through Blackboard. Mrs. Cole currently serves as the technology coordinator for the Finite Mathematics course and the primary instructor for both Trigonometry and Precalculus on the Natchitoches campus.

Dr. Reeves has a Ph. D. in Curriculum and Instruction, specializing in mathematics pedagogy. She has taught mathematics in middle school through college as well as courses for preservice and inservice teachers in the School of Education over a period of twenty years. She is especially interested in thematic, multi-disciplinary, and activity-based teaching and learning, and has co-authored several presentations and papers with colleagues that focus on collaborative teaching across traditional discipline areas. She has also used technology, primarily content-appropriate calculators, in all of her classes throughout two decades of teaching.

Dr. Fountain is an educational technologist with experience in lab design, construction, and management as well as expertise in the assessment of student learning outcomes. As a doctoral student in the College of Education, Dr. Fountain managed the student labs, maintained the equipment and participated in the design and construction of a dedicated teaching lab and distance education classroom. As Assessment Coordinator for the Division of Information Technology at Seton Hall University, Dr. Fountain led the effort to assess the educational impact of Seton Hall's Laptop Computer Program and its related support activities. In addition to lab management and outcomes assessment, Dr. Fountain has a decade's worth of experience helping college faculty and public school teachers effectively integrate technology into their teaching practices.

Mrs. Lane began her career as a secondary mathematics, general science, and physics teacher and has become a tremendous resource to the Department of Mathematics at NSU for her knowledge of applications that connect mathematics and the sciences. She has been instrumental in the creation of materials such as the middle school science curriculum, Science Out Of This World (SOOTW), produced and distributed by the Space Science Group at Northwestern State University. That curriculum consists of a series of hands-on experiments to encourage middle school students to become more involved in the study of science and mathematics. Mrs. Lane is a member of the mathematics faculty at NSU, but she still keeps her hand in science classrooms by teaching one section of our introductory physical sciences course each semester. Her experiences will be invaluable as we write mathematics laboratory instructions and worksheets.

e. ECONOMIC AND/OR CULTURAL DEVELOPMENT AND IMPACT

e.1 Relationships with Industrial/Institutional Sponsors

Northwestern State University has an active, ongoing commitment to partnerships with local industries. Local industries have, on occasion, requested training for employees on mathematical topics through the Department of Mathematics. Funding of this grant will facilitate the department in meeting these requests effectively and efficiently, as well as helping employees of local industries connect the mathematics they study to workplace tasks and skills. The likely results of training partnerships with local industries will be stronger connections between the institution and local industries, increases in for-credit enrollment of industry employees as course work becomes more accessible through innovative content delivery means, and direct involvement of the university in enhancing the economic development of our service area.

In addition, it is the intention of the Department of Mathematics to seek future funding through the National Science Foundation (NSF) Course, Curriculum, and Laboratory Improvement (CCLI) grant program. CCLI will allow the faculty of the Department of Mathematics to expand the Mathematics Enhancement Laboratory (MEL) and disseminate the program and laboratory manual both regionally and nationally. NSF grants bring not only additional funding into the University, but also prestige and national recognition to those institutions which write successful grant applications. The funding of this grant is the first step in showcasing Northwestern State University and the state of Louisiana for its innovative mathematics teaching strategies.

e.2 Promotion of Economic Development and/or Cultural Resources

George Bush stated, "The role of government is to create conditions in which jobs are created, in which people can find work." The most effective way to create jobs and minimize poverty is by promoting a favorable business environment to attract private capital investment and higher-skill, higher-wage jobs. In its vision statement, Northwestern State University emphasizes the need to be "responsive to changing views and trends as it works to provide a highly-qualified workforce to promote economic development and to meet the needs that higher education can provide to students, state government, private enterprise, and society." The equipment and experiences this project will provide for the students at NSU will prepare them to enter an increasingly technology-based workforce with the problem solving and analytical skills expected by prospective employers.

Northwestern State University is a major employer in Natchitoches, Louisiana, and as such, the economic health of this institution positively influences the economy of our town. The positive impact of Northwestern on the area extends far beyond economics. Northwestern State University is a major driving force for economic and cultural development. The institution provides a bridge between educational, business, government, and community agencies that afford opportunities for growth through educational resources that help improve the quality of the workforce. University faculty and staff, through collaborative agreements with local industry, bring the University experience to the workforce. A key ingredient to the success of such programs is innovative content delivery methods. Through a hands-on approach to teaching mathematics, students will be able to connect their mathematics skills to real-life problems. Developing a skilled workforce able to transfer classroom mathematics skills to on-the-job problems is critical to advancing the economic development of the state of Louisiana.

Northwestern State University is already recognized as a leader in the education of mathematics teachers in the region, the state, and beyond. The National Council of Accreditation of Teacher Education (NCATE) has given the program glowing praise; local administrators claim that they have seen an extremely positive response to the departmental program. In this regard, the Mathematics Department at Northwestern State University has become widely known for its innovative and cutting-edge teaching strategies. The time has come to bring that same level of innovation to bear in the development of a well-trained workforce. Industries seek a well-informed and educated workforce. The changing nature of the work environment requires that employers provide ongoing educational experiences that are current and appropriate. This grant will allow the Department of Mathematics at Northwestern State University to extend mathematical educational experiences beyond the confines of brick and mortar into applications appropriate to local industries. The proposed efforts are designed to be specifically targeted to the needs of the employer by producing a workforce better able to transfer the mathematical skills learned in college into other environments and applications. These efforts will be critical in attracting new industry to the region and the state.

f. ADDITIONAL FUNDING SOURCES

Additional funding for this project will come from Northwestern State University and from Texas Instruments. The funding from NSU will be in the form of in-kind contributions (course load reductions for some Principal Investigators) and in-cash contributions funds for remodeling a space suitable for laboratory activities. Northwestern understands the importance of this project to the continued achievement of all academic programs at the University. This understanding is demonstrated by the commitment of matching funds. In the summer preceding grant funding, Northwestern State University is committed to expanding and remodeling Kyser Hall room 401 for use as the Mathematics Experiences Laboratory. This remodel will include removal of walls to open up an appropriate laboratory space, rewiring to meet the needs of the technology, and installation of security measures to insure the safety of the equipment.

The commitment of additional funding for this project by Northwestern State University of Louisiana is an indication of the widespread importance of the project to the University community as a whole. It should be noted that Northwestern State University is committed to being regionally and nationally recognized as an innovator in mathematics education.

In addition to the support from the university, the Department of Mathematics will also receive an in-kind contribution of training from Texas Instruments in the use of the TI-Navigator, a value of \$1,995. This training will provide the faculty with the necessary tools to effectively use the TI-Navigator and its software and build an innovative mathematics curriculum. Texas Instruments also provides calculators to the department's entire faculty through its volume purchasing plan. This allows faculty to have the most up-to-date technology for use in the classroom.

PREVIOUS BOARD OF REGENTS SUPPORT FUND AWARDS

In 1995, a proposal was written by members of the mathematics department to improve the amount and type of technology available for class use. The title of the project was “Mathematics at Northwestern – the Next Step.” Dr. Leigh Ann Myers participated in that project, along with Dr. Frank Serio, Dr. Stan Chadick and Dr. Lisa Galminas. A request was made for \$89,046, of which \$79,458 was funded for the 1996-97 academic year. These funds were used for equipment and software. The department now has 10 laptop computers available for use by faculty and students. These laptops are used as a portable computer lab in our upper level math classes and, along with multimedia projectors (also purchased with the grant), for class presentations. Several students and faculty have used this equipment to make presentations at regional meetings of professional organizations, such as the annual Louisiana-Mississippi section meeting of the Mathematical Association of America. The software purchased with the grant includes MAPLE, Scientific Workplace, PHASER, MATLAB, and Geometer’s Sketchpad. These programs have all been used in classes by many members of the faculty and have proved to be a valuable resource for students enrolled in our undergraduate research program.

This project follows a project in 1998-99 in which we brought together some fifty science and mathematics teachers from throughout the state to view our approach to using graphing technology with data collectors in teaching mathematics and science at Northwestern. This grant was funded at a level of \$58,000 and was entitled, “Success through Technology-Enlarging the Circle.” Dr. Leigh Ann Myers was the project director and Mrs. Kathleen Chadick and Dr. Stan Chadick served as co-project directors. The project centered on a symposium of educators throughout the state.

Another project, similar to the one mentioned in the paragraph above, was accomplished in 1999-2001. The project entitled “Northwestern Technology Connection” was funded for \$143,146 and was directed by Dr. Leigh Ann Myers with assistance from Mrs. Kathleen Chadick and Dr. Stan Chadick. This project enabled us to purchase calculator-based data collection equipment for supervising and cooperating teachers involved in the field experiences of our mathematics and science education students. We also purchased equipment that is housed at Northwestern and is available to these education majors. Dr. Myers and Mrs. Chadick conducted training for the teachers involved in the project.

Dr. Leigh Ann Myers and Dr. Kathy Autrey participated in a Board of Regents Support Fund grant in 1998. This \$33,257 grant entitled “Enhancing Support Courses at Northwestern” was designed to (1) enhance the teaching and learning of future elementary teachers by providing technology and hands-on training to development mathematical reasoning skills; (2) enhance teaching and learning of mathematical reasoning for business, pre-pharmacy, biology, and industrial technology majors through the use of technology; and (3) enhance preparation of business, pre-pharmacy, biology, and industrial technology majors through an assessment of the skills deemed essential by faculty in the respective disciplines and future employers. Pre-service elementary teachers were exposed to teaching with technology in number sense and geometry classes; they participated in activities related to the mathematical concepts and discussed techniques for innovative ways to motivate students in their study of mathematics. Business, pre-pharmacy, biology, and industrial technology majors were exposed to modeling and data analysis using both calculators and computers in their mathematics classes.

A multimedia in mathematics project, entitled “Mathematics in Action: Creating Multimedia Mathematics,” was funded as a 2-year project for the 2002-2003 and 2003-2004 academic years. The total funding for the project was \$83,844. As a result of this project, a classroom was equipped with multimedia technology including a video camera, SmartBoards, a document camera, a DVD player, and a computer which can be used to record from all these sources, and more, simultaneously. Online and multimedia supplements were created for courses such as College Algebra and Applied Calculus, as well as some general graphing calculator tutorials. The technology is also available to produce mathematics training videos for local industries and school systems partnering with the Northwestern Department of Mathematics.

**BOARD OF REGENTS SUPPORT FUND
TRADITIONAL AND UNDERGRADUATE ENHANCEMENT, FY 2007-2008**

Budget and Budget Justification Pages

Directions: Each line item under the columns "Support Fund Money Requested," "Institutional Match," and "Private Sector/Other Match" must be itemized, fully explained, and justified on a separate budget justification page(s). Attach additional justification pages as needed.

Title of Proposal: Mathematic Experiences Laboratory

Project Director(s): Leigh Ann Myers, Elizabeth R. Cole, Mary E. Reeves, Eric Fountain, and Roxanne Lane

Institution(s) of Higher Education: Northwestern State University of Louisiana

PROPOSED BUDGET:

	Support Fund Money Requested	Institutional Match ¹	Private/Other Match ²
A. Equipment ³	67,598		
B. Software	371		
C. Supplies	550		
D. Shipping/handling	905		
E. Installation			
F. Personnel training	8,100		1,995 in-kind
G. Other			
1. Construction		15,000 in-cash	
2. Network Wiring		1,450 in-cash	
3. Salaries	38,569	39,714 in-kind	
4. Travel	1,050		
5.			
H. Indirect costs	Not allowed	24,488 in-kind	
I. Maintenance	Strongly discouraged		
J. Total costs (A-I)	117,143	80,652	1,995 in-kind

1 Stipulate whether in-cash or in-kind. The Board strongly encourages the sharing of costs for proposed projects. Applicants and institutional officials should note, however, that the employing institution will be required to honor the commitments made in the original proposal before any awards are made. Discounts for equipment purchases are not allowable as institutional match.

2 The budget page(s) must reflect and the budget justification pages must explain any external funds that are claimed in the proposal. External funds and their expenditure must be accounted for in the same manner as Support Fund money and institutional match.

3 Equipment. If applicable, itemize and describe briefly the proposed equipment and its intended use in the project. Include the name, model number, and manufacturer(s).

(TR and UG Enhancement Program Budget and Budget Justification, Rev. 8/2007)

BUDGET NARRATIVE

A. EQUIPMENT BUDGET

Equipment for this project can be divided into four groups – LabQuest based data collection equipment, hands-on equipment, hardware/software, and storage and security. Equipment in each group is listed below. For a description of how the various pieces of equipment will be used, see part c.1 of this proposal. Some quantities vary because of equipment already on hand.

Item	Qty.	Unit Cost	Total Cost
Vernier LabQuest	60	\$299.00	\$17,940
Motion Detector	50	\$75.00	\$3,750
Dual Range Force Sensor	50	\$109.00	\$5,450
Microphone	5	\$37.00	\$185
Temperature Probe	50	\$29.00	\$1,450
pH Sensor	10	\$78.00	\$780
Light Sensor	50	\$12.00	\$600
Clinometers	9	\$20.00	\$180
100' tape measure	6	\$17.00	\$102
Trundle Wheel (metric)	6	\$30.00	\$180
Bouncing Ball	60	\$1.00	\$60
Tuning Forks	15	\$10.00	\$150
Ring Stands	30	\$11.00	\$330
Rings with Clamps	30	\$3.00	\$90
100 ml Beakers	15	\$2.00	\$30
Weight Sets	60	\$10.00	\$600
Scissors	60	\$3.00	\$180
TI-Navigator Classroom Set	1	\$3,995.00	\$3,995
Computers	4	\$1,100.20	\$4,401
Document Camera	1	\$2,546.00	\$2,546
SmartBoard Presentation Package (Details in c.1)	1	\$18,000.00	\$19,500
Printer	1	\$750.00	\$750
Plastic Storage Bins	14	\$5.00	\$70
Case for Vernier LabQuest Class Set	2	\$102.00	\$204
Electronic Door Lock	1	\$1000.00	\$1,000
Extra Fob Keys for Lock	10	\$7.50	\$75
Computer Desks	3	\$1,000.00	\$3,000
Total Equipment Request			\$67,598

B. SOFTWARE BUDGET

Logger Pro is the software sold by Vernier that allows for easy transfer of data between the Vernier LabQuest data collection device and the computer. Logger Pro is also capable of receiving data from data collection probes directly into a computer or from user inputs. It is also an excellent program that can be used on its own or with handheld calculators for data analysis

curve fitting. The site license includes a license for all computers in the department as well as faculty and student home computers. Licenses for Microsoft Office 2007 or equivalent will be purchased for the three student computers and the presentation computer in the laboratory classroom.

Item	Qty.	Unit Cost	Total Cost
Logger Pro Software Site License	1	\$159	\$159
Microsoft Office 2007	4	\$53	\$212
Total Equipment Request			\$371

C. SUPPLIES

Supplies are a necessity for the training and dissemination workshops to be held in January and May 2009. There are approximately 20 NSU instructors, including adjuncts, who teach the focus courses. Those 20 will attend the January training and be joined by 15 other mathematics faculty members from throughout the state for the May dissemination session. Materials such as pens, paper, folders, name badges, etc. will be needed. The estimated cost for each participant per workshop is \$10. Total cost the January workshop will be \$200 and the May workshop will be \$350, for a total supply budget of \$550.

D. SHIPPING/HANDLING

Vernier quotes shipping costs of \$905 for the LabQuest and data collection probes requested. The other materials include free shipping to the University.

E. INSTALLATION

Necessary installation, including all wiring among components for the presentation station in the laboratory classroom, is included in the equipment costs for the SmartBoard Presentation Package. The University's multimedia classroom contract provider supplied an estimate for all of the SmartBoard equipment which includes installation.

F. PERSONNEL TRAINING

Training and dissemination workshop participants will need to be paid for their time and travel. Stipends of \$75 per participant per day for Northwestern State University faculty members are requested for the one day training in January 2009 and for the two-day workshop in May 2009. We are estimating stipends for 16 Northwestern faculty members (other than principal investigators) who teach College Algebra at a total cost of \$3,600.

Stipends of \$150 per participant per day for faculty members from other institutions to come to the two day dissemination workshop in May 2009 are also requested. The increase in stipend is to allow for mileage and meal expenses. We estimate 15 faculty members from other institutions will come to the workshop to learn about the project and give us feedback on the laboratory materials. Stipends for these visiting faculty members total \$4,500.

Texas Instruments will contribute a workshop training all interested faculty on the use of the TI-Navigator response system. That system will be purchased for use in the laboratory classroom so that student data and responses can be easily compiled by instructors. The value of the workshop, funded by Texas Instruments as an in-kind contribution, is \$1,995.

G. OTHER

G1. CONSTRUCTION

Renovation of the laboratory area will include tearing down two existing walls and reconstructing one wall to form a larger space suitable for a whole class laboratory experience. The renovations will be performed by the NSU physical plant staff with the use of contractors only when required by local building codes. The physical plant estimate for the cost of renovation is \$15,000, which will be contributed as an in-cash match from the university.

G2. NETWORK WIRING

Computer network wiring will be completed by the University's contracted wiring company. That contract will be renegotiated before the term of the proposed project, so a bid was obtained at the current contracted rates, and a suggested 25% increase was assumed to reach a total of \$1,450 expense for rewiring the remodeled laboratory classroom. The necessary rewiring will be paid for with an in-cash match from Northwestern State University.

G3. SALARIES

Members of the project team will have to devote a considerable amount of time to the project, and should be compensated accordingly. That compensation will be in the form of course load reductions provided as match by the University during the fall 2008 and spring 2009 semesters. Work will also be required during the two summers of the project, and we are requesting Support Fund money for salaries during those summers. Duties of the various project members are described below the table.

Employee	Summer 2008	Summer 2009	University Match
Dr. Leigh Ann Myers	\$4,864	\$3,648	\$13,134
Mrs. Beth Cole	\$3,846	\$2,885	\$5,192
Dr. Mary Reeves	\$4,221	\$3,166	\$5,699
Dr. Eric Fountain	\$2,741	\$2,056	\$3,700
Mrs. Roxanne Lane	\$2,997	\$2,248	\$4,046
TOTALS	\$18,669	\$14,003	\$31,771

Each member of the project team will receive salary for the duties performed as part of this project outside the normal 9-month faculty employment period. The amounts for each team member given in the table above are according to usual University policies for summer employment. Duties of the team members will vary. Fringe benefits of 18.05% for extra services are added to the summer employment amounts given in the table, while complete fringe benefits of 25% for the regular 9-month employment are added to the course load reduction University match amounts.

Dr. Myers will be the lead principle investigator and will coordinate all aspects of the project. Mrs. Cole, Dr. Reeves, and Mrs. Lane will primarily be responsible for creation of the laboratory activity documents as well as testing and revising those documents during the term of the project. Dr. Fountain will be responsible for coordination of scheduling for the laboratory construction and use as well as creation and analysis of assessment instruments for the project.

More information on the duties and activities of each team member can be found in section b.2 and below.

During the summer of 2008, each member will receive salary equal to the normal salary for teaching one summer course, calculated as 2/27 of the 9-month salary for each individual. Dr. Myers will order all equipment and materials needed for implementation and assist other team members. Dr. Fountain will coordinate renovations with the NSU physical plant and begin work on project assessment instruments. The other three team members will begin writing laboratory materials so that initial testing of some labs can begin during the fall 2008 semester.

The university will provide course load reductions, calculated as 1/10 of the 9-month salary per course for each individual since the standard course load for NSU faculty is ten 3-hour courses per 9 months. Dr. Myers will receive a one course load reduction in both the fall 2008 and spring 2009 semesters in order to allow coordination of the team efforts, assistance for other team members, and project reporting. Mrs. Cole and Dr. Reeves will each receive a one course load reduction in fall 2008 to allow completion of writing the laboratory materials. Dr. Fountain and Mrs. Lane will each receive a one course load reduction in spring 2009 to allow coordination of the laboratory and faculty mentoring as described in section b.2.

During the summer of 2009, each member will receive salary equal to two weeks' salary, calculated as 1/18 of the 9-month salary for each individual. The efforts during this final summer of the project will be leading the dissemination workshop, compiling results and comments from the dissemination workshop, revision of the laboratory materials, assessment of the project success, preparation of a final laboratory manual, and final project reporting. Individual responsibilities will be as noted above.

G4. TRAVEL

The participants in the two day dissemination workshop in May 2009 who travel from other institutions will require overnight accommodations. Funds are requested to pay for hotel rooms for those 15 participants for one night, at the state conference rate of \$70 per night, for a total of \$1,050.

H. INDIRECT COSTS

Northwestern State University's federally approved negotiated facilities and administrative cost rate is 38% of salaries and wages. As such, Northwestern is offering as an in-kind institutional match 38% of the salaries described above for course load reduction. This match is equal to \$24,488.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME Dr. Leigh Ann Myers		POSITION TITLE Professor of Mathematics	
EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Northwestern State University, Natchitoches, LA	B.S.	1988	Mathematics Education
University of Southern Mississippi, Hattiesburg, MS	M.S.	1989	Mathematics
Louisiana State University, Baton Rouge, LA	Ph.D.	1994	Mathematics

RESEARCH AND PROFESSIONAL EXPERIENCE: Starting with present position, list, in reverse chronological order, previous relevant employment, experience, and honors. Key personnel includes the principal investigator and any other individuals who participate in the development or execution of the project. Key personnel typically will include all individuals with doctoral or other professional degrees, but in some projects will include individuals at the masters or baccalaureate level provided they contribute in a substantive way to the development or execution of the project. Include present membership on any Federal Government public advisory committee. List, in reverse chronological order, the titles, all authors, and complete references to pertinent publications during the past five years and to representative earlier publications pertinent to this application. DO NOT EXCEED TWO PAGES.

EXPERIENCE:

Northwestern State University of Louisiana, Professor, 2007-Present. Associate Professor, 2001-2007.
Assistant Professor, 1994-2001.
DeSoto Parish School Board, High School Mathematics Teacher, 1990.
University of Southern Mississippi, Graduate Assistant, 1988-89.

RESEARCH and PUBLICATIONS:

- “Springboard into Math”, *Proceedings of E-Learn 2005 World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education*, Association for the Advancement of Computing in Education, 2005
- “Using ViewletBuilder 3 to Enhance Online Courses”, *Proceedings of ED-MEDIA 2003 World Conference on Educational Multimedia, Hypermedia & Telecommunications*, Association for the Advancement of Computing in Education, 2003
- “Mathematics in Action: Creating a Graphing Calculator Tutorial”, *Proceedings of E-Learn 2003 World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education*, Association for the Advancement of Computing in Education, 2003
- “Competency Exams in College Mathematics”, *Proceedings of the 12th International Conference of the Society for Information Technology & Teacher Education*, Association for the Advancement of Computing in Education, 2001
- “Fifteen Problems that Outline a College Algebra Course”, *Proceedings of the Thirteenth Annual International Conference on Technology in Collegiate Mathematics*, Addison Wesley Longman, 2001
- “Teaching Mathematics with Computers, Calculators, or No Technology: What is Appropriate?” *IEMS 2000 Proceedings of the International Conference on Industry, Engineering, and Management Systems*, 2000
- “The Effects of Technology on an Undergraduate Mathematics Department”, *Mathematics / Science Education & Technology Annual Proceedings*, Association for the Advancement of Computing in Education, 2000

GRANTS:

A Mathematics Teaching Framework: Core Concepts, Tasks, & Student Data, LaSIP, Co-Project Director 2004-2005, Project Director 2005-2007. Amount Received: \$152,154 (Year 1), \$126,306 (Year 2), and \$153,000 (Year 3).

Mathematics in Action: Creating Multimedia Mathematics, BoRSF, Project Director, 2002-2004. Amount Received: \$101,994.

Preservice Mathematics Analysis at Northwestern, LaSIP, Project Director, 2001-2002. Amount Received: \$25,295.

The Northwestern Technology Connection, BoRSF, Project Director, 1999-2001. Amount Received: \$143,146.

Blue Ribbon Mini-Conference, LaCEPT, Project Director, 2000. Amount Received: \$10,775.

Faculty Mentoring Program, LaCEPT, Co-Project Director, 2000. Amount Received: \$35,424.

Enhancing Support Courses at Northwestern, BoRSF, Co-Project Director, 1999-2000. Amount Received: \$33,257.

Success through Technology-Enlarging the Circle, BoRSF, Project Director, 1998-1999.

Funding for the project included \$58,000 from BoRSF and \$16,725 from LaCEPT.

Mathematics at Northwestern -- the Next Step, LEQSF, Co-Project Director, 1996-1997. Amount Received: \$79,458.

PRESENTATIONS:

Successful Strategies: A is for Academics - Mathematics Teaching Frameworks, Invited Presentation, LA GEAR UP Spring Retreat, Ruston, LA, April 2006.

Using Microsoft Office Specialist Certification to Enhance Employment Opportunities for College Students, Research/Technical Showcase, E-Learn 2004 World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education, Washington, DC, November 2004

TEACH: A Content Initiative – Providing Resources for Teachers, Contributed Paper, Annual meeting of the Mathematical Association of America Louisiana-Mississippi Section, Natchitoches, LA, March 2002

The Effects of Technology on an Undergraduate Mathematics Department, Brief Paper, International Conference on Mathematics/Science Education & Technology, San Diego, CA, February 2000

ATLAST: Augmenting the Teaching of Linear Algebra through Software Tools, Contributed Paper, Annual meeting of the Mathematical Association of America Louisiana-Mississippi Section, Jackson, MS, February 1997

Undergraduate Research in Mathematics, Project NExT Presentation, Annual meeting of the Mathematical Association of America Louisiana-Mississippi Section, Baton Rouge, LA, March 1996

PROFESSIONAL ACTIVITIES:

Louisiana Systemic Initiatives Summer Project. Instructor. 1997, 1999-2002, 2004-2006.

Mathematical Association of America PREP Workshop, Participant, 2005

Louisiana State Mathematics Textbook Adoption, Committee Member, 2004

Louisiana Grade Level Expectations Middle School Mathematics, Committee Member, 2003.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME

Mrs. Elizabeth Cole

POSITION TITLE

Assistant Professor of Mathematics

EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.)

INSTITUTION AND LOCATION

DEGREE

YEAR
CONFERRED

FIELD OF STUDY

Transylvania University, Lexington, KY

B.A.

1992

Mathematics/Secondary Education

University of Tennessee, Knoxville, TN

M.S.

1994

Mathematics

Northwestern State University, Natchitoches, LA

Ed.S.

2003

Educational Leadership & Instruction

RESEARCH AND PROFESSIONAL EXPERIENCE: Starting with present position, list, in reverse chronological order, previous relevant employment, experience, and honors. Key personnel includes the principal investigator and any other individuals who participate in the development or execution of the project. Key personnel typically will include all individuals with doctoral or other professional degrees, but in some projects will include individuals at the masters or baccalaureate level provided they contribute in a substantive way to the development or execution of the project. Include present membership on any Federal Government public advisory committee. List, in reverse chronological order, the titles, all authors, and complete references to pertinent publications during the past five years and to representative earlier publications pertinent to this application. DO NOT EXCEED TWO PAGES.

SEE VITA ON NEXT PAGE

Elizabeth Ann Robinson Cole

229 Taylor Road

Natchitoches, LA 71457

(318) 354-8018 or (318) 357-4350

EDUCATION

Northwestern State University. Ed.S. Educational Leadership and Instruction. 2003.

University of Tennessee. M.S. Mathematics. 1994.

Transylvania University. B.A. Mathematics/Secondary Education. 1992.

ADDITIONAL EDUCATION

University of Southern Mississippi. PhD in Progress. Adult Education. 2007-present.

University of Tennessee. 16 graduate hours in Statistics. 1996-1997 and 2000-2001.

EXPERIENCE

Northwestern State University of Louisiana. Assistant Professor. 2002-Present.

Northwestern State University of Louisiana. Instructor. 2001-2002.

Bossier Parish Community College. Instructor. 1999-2001.

Northwestern State University of Louisiana. Adjunct Instructor. 1997-1998.

Sabine State Bank, Many, LA. Mortgage Loan Servicing Manager. 1997-1998.

University of Tennessee, Knoxville, TN. Instructor. 1995-1997.

Knox County Board of Education, Knoxville, TN. High School Mathematics Teacher.
1994-1995.

University of Tennessee, Knoxville, TN. Graduate Teaching Associate. 1993-1994.

University of Tennessee, Knoxville, TN. Graduate Teaching Assistant. 1992-1993.

PROFESSIONAL ACTIVITIES

Northwestern General Studies Council Member. 2006-Present.

Demon Mathematics Classic Competition. Developer and Director. 2003-Present.

Mathematics of Statistics. Course Steward. 2002-Present.

Northwestern Student Support Services. Board Member. 2002-Present.

PUBLICATIONS

A Supplement to A Survey of Mathematics with Applications, 2nd ed., Person Custom
Publishing, Boston, 2005.

“Building Community in Online Courses.” SITE 2004 Proceedings, Association for the
Advancement of Computing in Education, 2004.

A Supplement to A Survey of Mathematics with Applications, Person Custom
Publishing, Boston, 2003.

PRESENTATIONS

“Building Community in Online Courses.” SITE International Conference, 2004.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME Dr. Mary E. Reeves		POSITION TITLE Associate Professor of Mathematics	
EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Louisiana State University, Shreveport, LA	B.A.	1992	Mathematics/Business Education
Louisiana State University, Baton Rouge, LA	M.A.	1990	Curriculum and Instruction/ Mathematics Education
Louisiana State University, Baton Rouge, LA	Ph.D.	1993	Curriculum Theory

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Academic Employment

August 2005 to present	Associate Professor
Department of Mathematics, Northwestern State University of Louisiana, Natchitoches, LA	
September 2003 to June 2005	Middle School Mathematics Teacher
New York City Department of Education, Brooklyn, NY	
August 2001 to July 2003	Assistant Professor
Department of Education Studies, Adelphi University, Garden City, NY	
August 1998 to August 2001	Assistant Professor
Department of Curriculum and Instruction, State University of New York, Oswego, NY	
January 1994 to August 1998	Assistant Professor
August 1992 to December 1993	Instructor
School of Education, Northwestern State University of Louisiana, Natchitoches, LA	
Summer 1990	Teacher
Sixth Grade Mathematics Remediation Project, Louisiana State University, Baton Rouge, LA	
August 1988 to May 1992	Graduate Teaching Assistant
Department of Curriculum and Instruction, Louisiana State University, Baton Rouge, LA	
June 1987 to May 1988	Teacher
Airline High School and Haughton High School, Bossier Parish School Board, Benton, LA	

Licensure and Certification

New York State Permanent Teaching Certificate, #434069799, Mathematics (7–12), issued September 2005.

New York City Department of Education License, File #818207, Teacher of Mathematics in Day High Schools (628B) and Teacher of Mathematics in Junior High Schools (762B), issued September 2003.

New Jersey Standard Teaching Certificate, #00360718, Mathematics, issued May 2002.

Louisiana Teaching Certificate. #P122773, grades in Mathematics, and Business, except Shorthand (7–12), issued May 1987.

Educational Attainment

- Ph.D., Curriculum Theory, Louisiana State University in Baton Rouge, Baton Rouge, LA, December 1993. Dissertation: Mathematics and Gender: A General History of Recent Research and Common Perceptions
- M. A., Curriculum and Instruction and Mathematics Education, Louisiana State University in Baton Rouge, Baton Rouge, LA, May 1990. Major: Curriculum and Instruction, Minor: Mathematics Education
- B. S., Secondary Mathematics Education and Secondary Business Education, Louisiana State University in Shreveport, Shreveport, LA, May 1987. Major: Secondary Mathematics Education, Minor: Secondary Business Education
- Kappa Delta Pi, Education Honor Society, Inducted: Spring 1986, Louisiana State University in Shreveport

Selected Papers

- Reeves, M. E. Misplaced distrust: Examining the struggles between urban teachers and administrators from the inside (working title).
- Duchardt, B., Marlow, L., Inman, D., Christensen, P., & Reeves, M. (January/February 1999). Collaboration and Co-Teaching: General and special education faculty. *The Clearing House*, 72(3), 186-190.
- Marlow, L., Inman, D., & Reeves, M. E. (Spring 1998). Using field trips and interdisciplinary teaching to enhance knowledge in methodology and content. *The Professional Educator*, 20(2), pp. 55-65.
- Marlow, L., Inman, D., & Reeves, M. (Winter 1996). Preservice elementary methods: Thematic unit teaching. *SRATE Journal*, 5(1), pp. 28-32.
- Reeves, M. E. (1992). Gender, technology, and mathematics education: Working together to achieve "equality." Paper presented at the Annual Meeting of the American Education Research Association, San Francisco, CA, April, 1992. (ERIC Document Reproduction Number ED 353148)

Grants

- "Teaching Scholars Program," with Frank Serio (Division of Mathematics and Physical Sciences), Northwestern State University of Louisiana in Natchitoches, LA; funded in January, 1996, by the Louisiana Collaborative for Excellence in the Preparation of Teachers, for \$18,084, for three undergraduate scholarships.
- "Mathematics Education Renewal at Northwestern," with Frank Serio (Division of Mathematics and Physical Sciences), Northwestern State University of Louisiana in Natchitoches, LA; funded in January, 1996, by the Louisiana Collaborative for Excellence in the Preparation of Teachers, for \$35,000.
- Faculty Participant, "Goals 2000 Technology Infusion Project" (multi-year project; single-year funding approximately \$388,000), and "Project SMART" (Science/Mathematics Applied Resources for Teaching; multi-year project; single-year funding approximately \$89,000), State University of New York at Oswego. Both of these projects emphasize collaboration with public school personnel (adults and children) to improve the use of technology and the teaching of mathematics and science.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME Dr. Eric Fountain		POSITION TITLE Instructor of Mathematics	
EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Louisiana State University, Baton Rouge, LA	B.A.	1990	Political Science
Louisiana State University, Baton Rouge, LA	M.A.	1995	Political Science
Northwestern State University, Natchitoches, LA	Ed.D.	2001	Educational Technology

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PROFESSIONAL EMPLOYMENT

Date: August 2007 to present
 Location: Dept. of Mathematics, Northwestern State University of Louisiana
 Position: Instructor
 Responsibilities: Teach Computer Application Courses
 Conduct research, present and publish.
 Develop collaborative grant and research projects

Date: March 2005 to December 2006
 Location: Berry College, Mount Berry, Georgia
 Position: Director of Institutional Research and Assessment
 Responsibilities: Provide leadership for the Institutional Effectiveness Committee.
 Manage the College's data collection and reporting.
 Assure compliance with Federal reporting requirements
 Participate in campus assessment activities.
 Conduct research, present and publish.
 Develop collaborative grant and research projects

Date: June 2003 to February 2005
 Location: Department of Information Technology, Seton Hall University, South Orange, NJ
 Position: Assessment Coordinator
 Responsibilities: Provide leadership for the Mobile Computing Assessment Team.
 Manage the Department's Performance and Cost Metrics Project.
 Participate in campus assessment activities.
 Conduct research, present and publish.
 Develop collaborative grant and research projects

Date: October 2000 to June 2003
 Location: Teaching, Learning, and Technology Center, Seton Hall University, South Orange, NJ
 Position: Research Associate
 Responsibilities: Provide analysis of assessment data for Seton Hall University's Mobile Computing Program.
 Participate in campus assessment activities.
 Conduct research, present and publish.
 Develop collaborative grant and research projects.
 Other duties assigned by Director of the Institute for Technology Development and CIO of the Division of Information Technology.

Date: January 2002 to May 2004
 Location: Adelphi University, Manhattan and Garden City, NY
 Position: Adjunct Faculty
 Responsibilities: Teach graduate level courses in the Department Educational Leadership and Technology.

PUBLICATIONS

Collins, J., Easterling, J., Fountain, E. & Stewart, H. (2004, Fall). *The Impact of Mobile Computing on General Satisfaction, Learning Outcomes, and Technology Use at Seton Hall University*. Journal of Computing in Higher Education (16, 1) 128-149.

WORKSHOPS

"The Process and Challenge of Conducting Survey's on the Web," workshop presented at the 2003 Assessment Institute at Indiana University – Purdue University Indianapolis in October, 2004.

"The Process and Challenge of Conducting Survey's on the Web," workshop presented at the 2003 Assessment Institute at Indiana University – Purdue University Indianapolis in November 2003.

PROFESSIONAL PRESENTATIONS

Beyond the First Four Years: An Update on the Assessment of Seton Hall University's Mobile Program" paper presented at the EDUCAUSE Mid-Atlantic Regional Conference in Baltimore, MD in January, 2004.

"Evaluation of General Satisfaction, Technology Use, and Student Perceptions of the Impact of Mobile Computing on the Learning Environment at Seton Hall University," paper presented with John Collins, Janet Easterling, and Heather Stewart at the Annual Meeting of the American Educational Research Association in Chicago, IL in April, 2003

"An Evaluation of Ubiquitous Computing at Seton Hall University," paper presented with John Collins and Janet Easterling at the EDUCAUSE Mid-Atlantic Regional Conference in Baltimore, MD in January 2003.

"Assessing the Impact of a Large-Scale Technology Initiative on the Teaching and Learning Environment," paper presented with Heather Stewart at the AAHE Assessment Conference in Boston, MA in June, 2002.

"The Ubiquitous Computing Assessment Data Repository: A New (Free) Tool for Program Assessment," paper presented with Bert Wachsmuth and Heather Stewart at EDUCAUSE Mid-Atlantic Regional Conference in Baltimore, MD in December 2001.

"Assessing the Effects of Ubiquitous Computing on Faculty/Student Interactions at Seton Hall," paper presented at Syllabus 2001 in Cincinnati, OH in April 2001.

"Curriculum for Media Literacy: Building a Theoretical and Philosophical Foundation for Media Studies," paper presented with Mary E. Reeves at the Annual Meeting of the American Educational Research Association in San Diego, CA, in April, 1988.

"Seeking a Theoretical Foundation for Computer Use in the Classroom" paper presented at the 19th Annual JCT Conference on Curriculum Theory and Classroom Practice in Bloomington, Indiana in October 1997.

"Ethical Considerations in Computer-Mediated Distance Education" paper presented at the Annual Research Day at Northwestern State University of Louisiana in April 1997.

"Virtual Classroom – Graduate Studies On-Line" paper presented at the Louisiana Association of Computer Using Educators Spring Conference at Northwestern State University of Louisiana, March 1997

"Strategic Planning and Evaluation" panelist for Louisiana LEARN for the 21st Century Regional Technology Meetings held at the University of Southwestern Louisiana on January 25th, 1996 and Northeast Louisiana University on February 1st, 1996.

"Heritage Education on the World Wide Web" workshop presented at the Heritage Education Institute at Northwestern State University of Louisiana in August 1996.

HONORS

Elected to the Fellowship of the Society for Values in Higher Education, March, 1998.

Member, Kappa Delta Pi, an International Honor Society in Education, April, 1995.

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and consultants and collaborators. Begin with the principal investigator/program director. Photocopy this page for each person.

NAME Mrs. Roxanne Lane		POSITION TITLE Instructor of Mathematics	
EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Northwestern State University, Natchitoches, LA	B.S.	1979	Mathematics/Science Education
Louisiana State University, Shreveport, LA	M.Ed.	1992	Educational Supervision

RESEARCH AND PROFESSIONAL EXPERIENCE: Starting with present position, list, in reverse chronological order, previous relevant employment, experience, and honors. Key personnel includes the principal investigator and any other individuals who participate in the development or execution of the project. Key personnel typically will include all individuals with doctoral or other professional degrees, but in some projects will include individuals at the masters or baccalaureate level provided they contribute in a substantive way to the development or execution of the project. Include present membership on any Federal Government public advisory committee. List, in reverse chronological order, the titles, all authors, and complete references to pertinent publications during the past five years and to representative earlier publications pertinent to this application. DO NOT EXCEED TWO PAGES.

TEACHING EXPERIENCE:

- Instructor, College of Science & Technology, Math Department, Northwestern State University, (August 1993-present) Courses taught: Math 0920 (Remedial Algebra), Math 1020 (College Algebra), Math 2030 (Elementary Math), Math 2040 (Informal Geometry), Science 1010 (Physical Science) and Science 2010 (Earth/Space Science)
- Site Coordinator for Science Out Of This World (August 1993 – July 2002)
 - Co-authored laboratory manual for *Science Out Of This World* (SOOTW) with Dr. Linda Roach, Laura Ponder, and Kelly Radzik-Marsh. Participated in video presentations of science content material for SOOTW. Maintained year-round contact with all participants. Composed quarterly newsletters for SOOTW. Composed surveys and evaluation forms used in research for SOOTW by Dr. Linda Roach. Coordinated all purchasing of science supplies and custom-made materials.
- Camp Discovery Coordinator (Summer 1995 – Summer 2001)
 - Coordinated all purchasing of science supplies and custom-made materials for camp classes. Interviewed, hired, and evaluated faculty and counselors at Camp Discovery. Composed original lessons; revised existing lessons taught at Camp Discovery. Trained counselors in ropes activities and general supervision of campers.
- Camp Discovery Faculty Member, Northwestern State University, Natchitoches, LA, Summers 1992-94. Classes taught: Robotics, Aviation, Buoyancy, Space Architecture.
- Adjunct Instructor, Northwestern State University School Of Nursing, Shreveport, LA, January 1991 - May 1993. Course taught: College Algebra (Math 1030)
- Classroom Teacher, C. E. Byrd High School, Shreveport, LA August 1992 - May 1993. Courses taught: AP Physics, Physics I, Physical Science
- Supervisory Intern, LSU-S, Shreveport, LA, spring 1992. Observed and evaluated untenured science teachers under Don Fowler, Secondary Science Supervisor, Caddo Parish
- Classroom Teacher, Woodlawn High School, Shreveport, LA, August 1979 - May 1991. Courses taught: Physics, Physical Science, Advanced Math, Geometry, Computer Science (programming in BASIC, FORTRAN and COBOL). Piloted Computer Literacy course and Principles of Technology course. Installed first computer lab at WHS, early 80s.
- Classroom Teacher, Maplewood Junior High School, Sulphur, LA, January 1979 - May 1979. Courses taught: 8th grade math, 7th grade science

EDUCATION

- Post-graduate studies in mathematics (18 hours for SACS qualification), Northwestern State University, Natchitoches, Louisiana, completed 2002
- M. Ed. and certification in Educational Supervision, 1992, Louisiana State University in Shreveport
- Certification in computer science and computer literacy, 1987, Louisiana State University in Shreveport
- B. S. and certification in mathematics, general science, and physics, 1979, Northwestern State University, Natchitoches

PARTICIPATION IN GRANTS

- LaCEPT Instructor, special low-enrollment classes for pre-service teachers, Fall 1997– Spring 2002. Science 1010 (physics/chemistry) and Science 2010 (earth/space science)
- SEDL Physics and Chemistry Enhancement and Reform (PACER), February 1996– May 1998. Assistant to Project Director.
- LASPACE Saturday Science Programs, 1993–94; Evening of Exploration, 1994–95, Family Fun Sessions, 1996–97. Taught sessions, assisted at science centers.

PROFESSIONAL SERVICE

- NSU College of Education NCATE Conceptual Frameworks Committee, 2004 – present
- Current member - LSTA, NSTA
- Presenter, National Science Teachers' Convention, 1993, 1995
- Presenter, Louisiana Science Teachers' Convention, 1994, 1996, 1998
- Presenter, Science teacher inservice training, Caddo Parish School Board, 1992–93
- Physical Science Textbook Adoption Committee, Caddo Parish School Board, 1989
- Pilot Teacher, Computer Literacy, 1986
- Science Fair Judge, Caddo Parish (1991); NSU Middle Lab (1996), Provencal (1998)
- Science Fair Judge, Region IV at NSU, 1996 – 2004

CURRENT AND PENDING SUPPORT

(From ALL sources, including Board of Regents Support Fund)

The following information MUST be provided for each investigator and other senior personnel. Use additional sheets as necessary.

NAME OF INVESTIGATOR: Dr. Leigh Ann Myers

Status of Support: <input type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future
Contract Number/Proposal Title: NONE
Source of Support:
Award Amount (or Annual Rate): \$ _____ Period Covered: _____
Location of Activity:
Person-Months or % of Effort Committed to the Project: <input type="checkbox"/> Cal Yr <input type="checkbox"/> Acad <input type="checkbox"/> Summ

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Person-Months or % of Effort Committed to the Project: <input type="checkbox"/> Cal Yr <input type="checkbox"/> Acad <input type="checkbox"/> Summ

(Form 3, rev.2007)

CURRENT AND PENDING SUPPORT
(From ALL sources, including Board of Regents Support Fund)

The following information MUST be provided for each investigator and other senior personnel. Use additional sheets as necessary.

NAME OF INVESTIGATOR: Mrs. Elizabeth Cole

Status of Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future

Contract Number/Proposal Title:

NONE

Source of Support:

Award Amount (or Annual Rate): \$ _____ Period Covered: _____

Location of Activity:

Person-Months or % of Effort Committed to the Project: ☐ Cal Yr ☐ Acad ☐ Summ

Status of Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future

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CURRENT AND PENDING SUPPORT
(From ALL sources, including Board of Regents Support Fund)

The following information **MUST** be provided for each investigator and other senior personnel. Use additional sheets as necessary.

NAME OF INVESTIGATOR: Dr. Mary E. Reeves

Status of Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future

Contract Number/Proposal Title:

NONE

Source of Support:

Award Amount (or Annual Rate): \$ _____ Period Covered: _____

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CURRENT AND PENDING SUPPORT
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The following information **MUST** be provided for each investigator and other senior personnel. Use additional sheets as necessary.

NAME OF INVESTIGATOR: Dr. Eric Fountain

<p>Status of Support: <input type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future</p> <p>Contract Number/Proposal Title:</p> <p>Source of Support: NONE</p> <p>Award Amount (or Annual Rate): \$ _____ Period Covered: _____</p> <p>Location of Activity:</p> <p>Person-Months or % of Effort Committed to the Project: <input type="checkbox"/> Cal Yr <input type="checkbox"/> Acad <input type="checkbox"/> Summ</p>
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(Form 3, rev.2007)

CURRENT AND PENDING SUPPORT
(From ALL sources, including Board of Regents Support Fund)

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NAME OF INVESTIGATOR: Mrs. Roxanne Lane

<div>Status of Support: <input type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future</div> <div>Contract Number/Proposal Title:</div> <div>Source of Support: NONE</div> <div>Award Amount (or Annual Rate): \$ _____ Period Covered: _____</div> <div>Location of Activity:</div> <div>Person-Months or % of Effort Committed to the Project: <input type="checkbox"/> Cal Yr <input type="checkbox"/> Acad <input type="checkbox"/> Summ</div>
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