



## MISSISSIPPI UNIVERSITY FOR WOMEN

### Middle School Mathematics in Context (MSMIC)

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Throughout the state of Mississippi, a need exists to develop strategies for teaching mathematics that will result in a greater student understanding of mathematical concepts and higher scores in mathematics on standardized tests. In addition, this need calls for action research, conducted by teachers in their classrooms, to determine which strategies are most effective for their students. Finally, teachers need to communicate the results of this research to other teachers in the state and the nation.

**Middle School Mathematics in Context (MSMIC)** is a four-week summer program with follow-up components during the school year that addresses these needs in several ways:

- By having participants spend two weeks reviewing and re-learning mathematics' concepts through problem-solving activities, the use of computer software, the practice of writing about mathematics, and the integration of mathematics with other subject areas;
- By teaching participants how to use action research to determine whether the strategies they are using in their classrooms are effective in increasing student performance;
- By having participants share their understanding through power point presentations and a website.

Participants' work will be evaluated through their written curriculum units, journals, videos, and power point presentations. The effectiveness of the project will be determined by the results of the action research studies. Will the achievement of participants' students increase?

**Middle School Mathematics in Context (MSMIC)** will build on the strengths of The Math Connection, the four-week project that was funded with money from the Eisenhower Foundation. Added to these strategies will be the action research component, enabling participants to document the effectiveness of their teaching.



## JACKSON STATE UNIVERSITY

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A major mission of Jackson State University is to develop and administer quality, comprehensive, career-oriented teacher education programs. The School of Education is one of five schools at the university primarily responsible for the administration and coordination of all programs in the training of teachers and other educational personnel, and works in concert with the arts and science divisions in designing curricula for pre-school through post secondary levels (P-12).

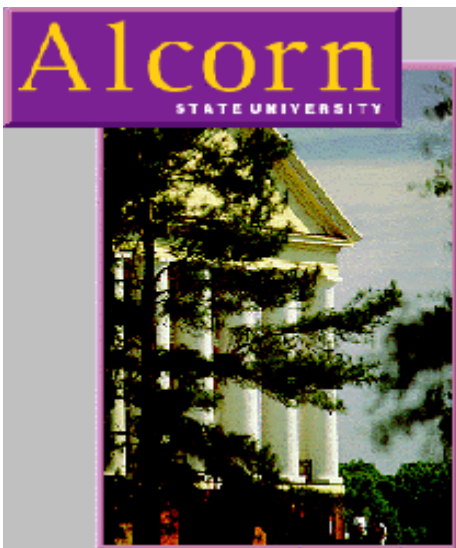
University teacher education programs and school districts across the state have underscored the **need** and importance of ongoing professional development of in-service teachers to retain them in the teaching arena and to support development of critical teaching skills and knowledge as relates to challenging subject areas, the arts and sciences, assessment, technology, and classroom management. One of the most intriguing challenges that the state has faced is the charge to implement quality programs and practices that provide **all** children with ample opportunities to advance in the educational arena. This challenge supports the need for the proposed partnership project.

The **new partnership** will include Jackson State University along with the arts and science divisions at the University, and **the Canton Public School District, a high needs LEA**, with a high poverty rate and a high percentage of teachers teaching out of their field. The **target population** is located in Central Mississippi, twenty miles north of the capitol city of Jackson and is comprised of four elementary, two middle and three high schools (grades PK-12), and approximately 3,754 students. The district consists of a *historically under-represented and under-served population and is considered a **critical needs area***.

The purpose of this partnership is to better equip pre-service and in-service teachers to meet the diverse needs of all learners in an increasingly multi-cultural society. The partnership will provide teacher access to programs and activities designed for the continued, on-going improvement of professional skills and knowledge needed to instruct and prepare students for the next century, as well as increase the pool of qualified teachers who can meet rigid certification requirements for licensure in an effort to address the critical teacher shortage in the state and nation.

The project **goals** are: 1) To provide systematic staff development for K-12 teachers in a high needs area based upon current research practices to enhance subject matter knowledge and teaching skills; 2) To provide training for integration of technology in schools and classrooms among students, teachers and school administrators; and 3) To facilitate training for the enhancement of management and leadership skills among school administrators in the target area for total school improvement.

This partnership will represent a posture of unified action, with numerous benefits. The most significant **project outcomes** will include: Strong collaboration between the University's teacher education program and local school district ( high need LEA); technology literate teachers, and administrators who can prepare students for the technological society; more effective principals and school administrators who demonstrate excellent management and leadership skills; better trained in-service teachers who demonstrate subject area competence; and improved performance among P-12 students.



## **ALCORN STATE UNIVERSITY**

### **Teaching Educators Advance Math And Science (Teams)**

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This is a new project proposed by the Department of Biological Sciences, Department of Chemistry and Department of Mathematics at Alcorn State University (ASU). This project's focus is on the needs of math and science middle and high school teachers in local school districts. Eighteen in-service teachers from the surrounding school districts will participate in a four-week summer workshop. The goals of the project are to: train teachers in modern techniques used in biology, chemistry and math; make them well aware of the computer applications in the field; stimulate their interest and increase the motivational levels of teachers and students; provide academic support designed to enhance the academic achievement of students.

Mississippi and other parts of the United States are experiencing a shortage of teachers. Fewer students are majoring in education and a large number of the current force of teachers is eligible for retirement. These facts apply to teachers of all disciplines. However, the outlook is far worse for math and science teachers. Research indicates that even our best high school math and science students scored lowest, on average, among their peers from 13 other industrialized nations based on recent standardized test scores.

Science is absolutely unique in the diversity and range of its subject matter, and provides a special challenge to the teachers attempting to introduce it to students. There is a misconception among many students that science is difficult and it's only for top scholars and all-around just plain boring. With the advent of modern academic advancements it is imperative that teachers and students become abreast of the rapid changes in their respective disciplines. It is essential that teachers adapt methodologies to which our students can perform at a maximum competency level. It is vital for strategic planning to become the nucleus of improving school performance for teachers and students. Teachers must be motivated, hard working, dedicated and visionary. Their vision and desire to adopt new teaching methods for classroom use should stimulate and motivate students.



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The purpose of the University of Southern Mississippi Math Institute is to improve the achievement of students in grades six through eight in the area of Mathematics by accomplishing the following goals:

- To improve the leadership skills of building-level administrators in facilitating math instruction, comprehension, and student achievement;
- To integrate mathematics topics directly related to content standards into daily instruction;
- To integrate and utilize technology into daily instruction (for example, graphing calculators and computer technology to access web-based resources and foster the learning concepts of mathematics);
- To be able to interpret appropriate data;
- To be able to develop and implement action plans addressing math content areas.

These goals will be accomplished through a comprehensive twenty-day summer program, with two days of follow-up, involving thirty participants from low achieving schools in selected districts in south central Mississippi. These participants will include ten teachers of mathematics whose education and training emphasized mathematics, ten teachers of mathematics whose education and training did not emphasize mathematics, and ten building-level administrators. A trainer of trainers model will be utilized so that upon completion, participants may become presenters at the district level.

Instruction will be provided by a team of instructors consisting of a university faculty member from the Department of Mathematics, university faculty members from the Department of Educational Leadership, and a practicing grades 6-8 Master Teacher.

The districts involved in this project include Covington County School District, East Jasper County School District, Greene County School District, Hattiesburg Public School District, Jefferson Davis County Schools, Laurel School District, Lumberton Public School District, Moss Point School District, Perry County Schools, West Jasper School District and Wayne County School District (alternate). These school districts currently have a high percentage of their faculty teaching in content areas for which they were only minimally prepared (for example, teachers on emergency, provisional, or temporary certification). Also, approximately 70% of the student population served in these districts comes from families with incomes below the poverty line.

Upon completion of the Math Institute, it is expected that results from the math portion of the 2004 MS Curriculum Test will show fewer students scoring at the minimal and basic levels. It is also anticipated that the rate of students passing Math in grades 6-8 during the 2003-2004 school year will increase as compared to the 2002-2003 school year. Range of school scores in math from participating districts are listed below.

*Minimal Level: 6<sup>th</sup> grade, 12.8%-40.8%; 7<sup>th</sup> grade, 33%-47.5%; 8<sup>th</sup> grade, 12.7%-52%*  
*Basic Level: 6<sup>th</sup> grade, 12.8%-27.2%; 7<sup>th</sup> grade, 21.1%-26.4%; 8<sup>th</sup> grade, 21.1%-34.8%*



## TOUGALOO COLLEGE

The proposed project is a new initiative for a 2003 summer institute for 20 mathematics teachers and principals. The institute will be held on the campus of Tougaloo College. The 20 participants will be selected from mathematics teachers and principals of grades 8-9 in the Central Mississippi Area. Those teachers needing certification and or mentoring and principals having less than 3 years experience will be given first priority. A teacher "in need" is defined as a new teacher, one who is teaching mathematics but not certified in mathematics, or one who has a weak background in mathematics.

The Division of Education and the Department of Mathematics at Tougaloo College will work collaboratively with partnership school districts in implementing the Tougaloo College Institute for Mathematics. The primary goals and objectives are as follows: 1) to assist noncertified teachers in Math compliance; 2) to provide a course of study leading to certification; 3) to provide curriculum enhancement and effective teaching strategies; 4) to provide hands-on technology websites accessible in critical needs areas; 5) to acquaint teachers and principals with National Standards necessary for the enhancement of student achievement; and 6) to assist school districts in improving test scores. Primary goals and objectives for the project be based on the principles and standards for school Mathematics set by the National Council for teachers of Mathematics.

Each participant will receive a stipend of \$80 per day, which covers incentive pay, travel expenses, and lunch for the duration of the project. Participants must also pay for the cost of four hours of college credit if desired. Upon successful completion of the summer institute part of the project, participants will receive four semester hours of credit for MAT445: Selected Topics in Mathematics.

The Project Director will be the Dean of Education at Tougaloo College. Key personnel will be instructors, as well as technology consultants from the Department of Mathematics and the Division of Education. These as well as an instructor will teach content materials, cognitive development, and pedagogical, methods and strategies respectively. Salaries are requested for the director, and additional instructors, and a Technology Coordinator for the academic year and as well as the follow-up sessions in the academic year.



**MISSISSIPPI STATE UNIVERSITY**

**Teacher Training In Physical Sciences  
(TTIPS )**

125 YEARS

1878 — 2003

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In this proposed new project, Training Teachers in Physical Science, TTIPS, a workshop will be implemented to provide specialized training in physical science concepts and technology for physics and physical science teachers in high schools and middle schools. Fifteen teachers will be trained in physics and physical science and mathematics content, use of the modeling instruction technique, and the judicious use of technology in teaching. The training involves three primary components: (1) a summer workshop on the campus of Mississippi State University during Summer 2003; (2) weekly online training and discussions during the school year; and (3) attendance at the joint meeting of the MSTA and MAP during Fall 2003.

The workshop is based on the nationally recognized Modeling Instruction workshop model developed by Arizona State University and adapted by sixteen universities nation wide. Providing this type of training will help meet the needs of nine school districts in Mississippi that serve children of low-income households, minority children, and/or high schools and middle schools with under-trained teachers.

TTIPS training engages high school and middle school teachers in learning about modeling techniques and technology for teaching physical science concepts of force, motion, velocity, and energy. With the TTIPS program, teachers learn instructional skills they can successfully integrate with physical science content to improve student learning.

From this project, it is expected that teachers will engage in more innovative instruction in their secondary and middle school classrooms which in turn will positively impact students' understanding of physical science concepts, beliefs about the nature of science, motivation for science, and standardized test scores in science. Furthermore, participants will be encouraged to present a workshop in their school or district during the 2003-04 school year, illustrating the use of technology and of the innovating instructional techniques learned from TTIPS training.

This project will be done with participation from Mississippi State University, and school districts from: Choctaw County, Columbus Municipal, Louisville Municipal, Lowndes County, Oktibbeha County, Noxubee County, Starkville, Webster County, and West Point.



## Mathematics Science Integration for Teachers

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The American Association for the Advancement of Sciences, Project 2061, and the National Science Teachers Association published the *Atlas of Science Literacy in 2001*, which links important benchmarks in mathematics, science, and technology. In the year 2000 the National Council of Teachers of Mathematics published *Principles and Standards for School Mathematics* and the Mississippi State Department of Education released its new *Mississippi Mathematics Framework*. Likewise, the *National Science Education Standards* were used directly to develop the *Mississippi Science Framework 2001*.

These three sources present a vision for reform in the teaching of science, mathematics, and technology to enable students in Mississippi to progress and achieve at higher levels than ever before. They suggest a more effective way of teaching and learning that emphasizes inquiry and problem solving as a way of achieving knowledge and understanding about the world. This project seeks to provide support for the high quality professional development needed to train and enhance teachers in integrated content and curricular implementation to meet the needs of their individual school districts in math, science, and technology.

Using best practices supported by research, math and science teacher teams from participating districts will intensively be engaged in integrated activities culminating in the dissemination of successful implementation at area conferences for the following school year at MSTA and MCTM. Additionally, training administrators will include integrated national based inquiry and problem solving with the team's administrators on the day of the administrator's conference. Twenty teachers from grades 6-10 will be invited to participate in a four-week project that will focus on integrated mathematics and science concepts.



**MISSISSIPPI STATE UNIVERSITY**

**Emphasis on Examine, Cultivating,  
and Enriching Learning in  
Engineering, Science, Technology,  
Environmental Education and  
Mathematics (ExCEL in ESTEEM)**

**125 YEARS**

**1878 — 2003**

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The purpose of ExCEL in ESTEEM, a mathematics and science educational institute is to provide public school teachers with opportunities for professional development in mathematics, science, engineering, and technology (SMET) as well as provide upper elementary and middle school students with opportunities for enrichment in science, mathematics, engineering, and technology. In-service and pre-service teachers will participate in the session to gain updated strategies for teaching and learning. The overall outcome of the project is to establish a pool of highly qualified teachers of mathematics and science and to target the low achievement and raise the proficiency level of Mississippi students in mathematics and science.

The main objectives of ExCEL in ESTEEM Strand I, In-service Teacher Development will be to: develop a cadre of teachers who use strategies which promote the participation of students in SMET and promote the interest of girls in SMET careers; instruct teachers to self-assess what teaching behaviors interfere with success of students in science; and expose teachers to strategies that promote academic achievement in SMET disciplines. Additionally, the researchers will work with school district administrators to provide on-going district professional development in promoting the goals of ExCEL in ESTEEM.



## DELTA STATE UNIVERSITY

### **Integrating Algebra and Geometry: Institute for Teachers of grades 6- Geometry**

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This proposal for a 2003 summer institute for mathematics teachers of grades 6-Geometry to be held on Delta Stat University campus. The 20 participants will be selected from mathematics teachers of grades 6-Geometry in the Mississippi Delta Area. A teacher “in-need” paired with a master teacher from the same school district will have priority. A teacher “in need” is defined as a new teacher, one who is teaching mathematics but not certified in mathematics, or one who has a week background in mathematics.

On May 30, 2003 the participants will come to campus for an orientation session and distribution of books. Regular class sessions (9:00 a.m. - 3:00 p.m.) will be held June 3, 2003 through June 27, 2003. There will be a two-day (Saturday) follow-up during the academic year – one during the fall semester and one in spring semester. Materials to be used will be mathematics textbooks for grades 6-Geometry, Principles and Standards for School Mathematics (National Council of Teachers of Mathematics , 2000), Mississippi Mathematics Framework ( Mississippi Department of Education), 2000), Navigating Through Algebra and Navigating Through Geometry (National Council of Teachers of Mathematics, 2001) and selected articles from Mathematics Teacher and Mathematics Teaching in Middle Grades. The focus will be algebra and geometry content for grades 6- Geometry with appropriate connections, assessment, teaching techniques, and manipulatives used in all sessions. The major purpose of the institute is to assist “in-need” teachers in acquiring knowledge and developing enthusiasm and excitement for teaching mathematics to their students. Each “in-need” teachers will be paired with a “master teacher” from the same school or district to insure a mentoring relationship for the “in need” teacher.



## **RUST COLLEGE**

### **Quality Teachers Together**

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Quality Teachers Together is a year-long intensive undertaking by the Divisions of Education and Science & Mathematics to bring about constructivist instruction in Science, English, Mathematics and Social Studies 6 – 12 classrooms in the Holly Springs and Marshall County School Districts. Both districts are Professional Development Partners with the Division of Education.

Marshall County is one of the poorest in the State of Mississippi and both districts have all of the problems endemic to prolonged poverty and high unemployment. Drugs are sold openly off the square in Holly Springs – available to students and adults alike. The schools are old (except for Holly High!), smelly and staffed by too many out-of-license and retired teachers or “expert citizens”. As a result, test scores on state annual examinations are poor with many students “guessing” and then sleeping.

Both Districts have worked intensively on reading and language arts, grades k – 3, and twelve math teachers are participating in Math Teachers Together during 2002-2003, but the other basic subjects are in need of professional attention. Most instruction in most subjects in most grades is whole class and teacher/textbook centered. However, the students are diverse in skill levels, interests and motivation to learn.

Quality Teachers Together will bring together thirty teachers, grades 6-12, from the two school districts for four weeks beginning July 7 and ending August 1, 2003. They will undergo intensive study in their field and intensive exploration of constructivism in the classroom (Child-centered instruction), best pedagogy, classroom management and exciting new/old activities such as multimedia projects and developing hands-on materials and activities. There will be a pre-workshop session, July 1 —3, 2003, to create MS Benchmark Checklists and evaluation forms for each of the four disciplines included in this project. There will be five Saturday workshops scattered throughout the 2003-2004 academic year to follow up on changes being made in instruction and in learning. Project personnel will follow up with visits to each participant’s classroom to consult and encourage changes towards constructivist-child-centered instruction. Evaluation will begin and end the project with pre-post tests and completed multimedia projects.

Rust College’s Division of Education, in partnership with the Holly Springs and Marshall County School Districts, is proposing a collaborative effort to improve the quality of teaching in English/Reading, Social Studies, Mathematics and Science for teachers in grades 6 through 12 for the year of this grant. All of the above areas are now being tested annually by the State Department of Education and both school districts need to improve their students test scores. Thus, it is proposed that intensive, sustained quality summer and fall workshops be instituted that will ground up to thirty teachers in the basics of best pedagogy which will include a variety of lesson plans based on the MS Benchmarks, best pedagogy in each field and increasing student learning through multimedia projects. Professional growth will also be enhanced by training the teachers in ethnography and the use of DVD video cameras in their classes to analyze and improve both instructional delivery and student responsibility for learning. Constructivism will underlie all of the content taught as will Cooperative Discipline (Linda Albert, 1996). Talks with both superintendents are ongoing about developing a multi-year Collaboration for Excellence between the three institutions and this proposal will be one piece of that joint effort. The Division of Education has Professional Development School agreements with both districts and plans are underway to make these a working reality.