

June 2003 - June 2004

Annual Project Report

June 26, 2004

MathVision Lab

LEQSF (2002-04)-ENH-TR-17

(LSU Proposal #14895)

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Quoting the original proposal, the **Mission** of the MathVision Laboratory at Louisiana State University, Baton Rouge, is as follows.

**Organize:** *The Lab will open up communications, coordinate resources and form collaborations between scholars and practitioners working in math education. Through its focus on mathematics and its network of individuals and organizations concerned with math education, the Lab will be a strong collaborative partner with other LSU entities with a wider set of goals, such as the Center for Scientific and Mathematical Literacy (CSML), the Office of Strategic Initiatives, the Institute for Partnerships in Education, and the Center for Applied Information Technology and Learning.*

**Support:** *The Lab will provide an infrastructure that will assist Lab personnel accomplish their specific project objectives and help them to obtain funding from grant agencies. Benchmark: apply for a total of at least one million dollars in external funding by 12/31/03.*

**Involve:** *The Lab will bring together scholars and practitioners to find common objectives with the intention to produce useful knowledge and to maintain close working relationships with intended users (classroom teachers, administrators, consultants, or policy-makers). The Lab will give users a strong voice in setting the agenda and it will align the resulting research projects with the full power of the university as the premier knowledge-seeking organization by tapping its research expertise in all relevant academic areas.*

**Research:** *The Lab will advance a research agenda that seeks a deep, fundamental understanding of mathematical proficiency, the ways in which it is acquired and the conditions necessary for its development. By accumulating knowledge and experience, it will become a source of trustworthy information about mathematics teaching and learning, information that will have utility for teachers, curriculum planners and policy-makers.*

**Develop:** *The Lab will produce research-based solutions to real-world problems in math education at all levels: curriculum materials, learning media, professional development institutes, support networks for K-16 math educators, and design of programs that recruit secondary math teacher candidates through nontraditional paths. It will oversee their implementation, track outcomes, engage in cycles of testing and improvement, and will ensure that research, development, and implementation will work hand-in-hand to produce measurable positive results.*

To an extent exceeding our most optimistic expectations, during the last year, the MathVision Lab has developed into an established unit, successfully fulfilling its mission.

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## Report

The LSU MathVision Laboratory leads a number of initiatives in educational outreach that fall outside the traditional research mission of the LSU Mathematics Department yet fall within the broader departmental mission that includes, along with research, the dissemination of knowledge and service based on departmental expertise. In January 2003, the MathVision Lab established headquarters in Prescott Hall as a partner of LSU's Gordon A. Cain Center which shares its secretarial staff with the MathVision Lab. Presently, MathVision Lab facilities include 12 offices for the directors and for instructors and graduate students working with the Lab. The Lab has its own teaching laboratory outfitted with computer technology purchased through a \$46K LSU Student Technology Fee grant and hosts a resource library for mathematics teachers.

The most concrete benchmark set in the original proposal was to apply for a total of at least one million dollars in external funding by 12/31/03. Through intensive collaborations with scholars, practitioners,

other academic units, universities, and private providers working in math education, the MathVision Laboratory is currently engaged in a leadership role in programs that bring in over \$4,000,000 in external funding to LSU and the local K-16 communities. Thus, the amount of external funding obtained exceeds the figure for which we promised merely to apply by 400%. An inventory of external funding sources shows the potential for a several-fold increase in these operations during the next few years.

The MathVision Lab directed the preparations of LSU's STEMTP and Robert Noyce Scholarship proposals to NSF, which resulted in two grants totaling \$1.5 million awarded in 2003. The two grants support the new Science, Technology Engineering and Math Majors with Concentration in Secondary Education program at LSU, in the design and implementation of which the MathVision Lab played, and still plays, a critical role.

Supported by over \$2.0 million in grants from the state's LaSIP/LINCS/LA GEAR UP and MSP programs, the MathVision Laboratory was instrumental in the design and creation of a substantial mathematics professional development unit within LSU's Gordon A. Cain Center that is currently providing year-round professional development institutes to over 150 mathematics teachers in the region.

In line with the general intent that MathVision should be an entrepreneurial unit, we undertook a number of initiatives that were not explicit in the original proposal because of their congruence with MathVision goals. For example, supported by LEQSF Education Enhancement grants, MathVision supported the creation of a Compressed Video Distance Education Initiative that pilots the delivery of AP Calculus courses, student support, and teacher professional development to several regional high schools and operates "In-School Mathematics Laboratories" at six regional middle and high schools.

Funded Projects with substantial participation of the LSU MathVision Laboratory (total: over \$4,000,000):

1. Louisiana Education Quality Support Fund (LEQSF), J. Madden, F. Neubrandner. In-School Mathematics Laboratories, \$306,464, 2002-2005.
2. Louisiana Systemic Initiatives Program (LaSIP), J. Madden, F. Neubrandner, 2003-2004. Adapting the TEXTTEAM Model to Louisiana. \$152,000, 2003-04.
3. NSF (Robert Noyce Scholarship Program). D. Kirshner, F. Cartledge, J. Madden, F. Neubrandner, W. Wischusen. Robert Noyce Scholarships at LSU, \$505,850, 2004-08.
4. NSF (CSEMS), S. Iyengar, C. Stelly, S. McGuire, F. Neubrandner, E. Woldesenbet. Technology Training and Academic Enhancement Program for Computer Science, Engineering, and Mathematics Undergraduate Students, \$396,604, 2003 – 06.
5. LSU Student Tech Fee Proposal (N. McAnelly, F. Neubrandner). Technology for Instruction, Teacher Preparation and Online Inst. Support in Math and Science. \$46,200, 2003-04.
6. NSF (STEMPT), F. Cartledge, D. Kirshner, J. Machen, J. Madden, E. Wischusen, Science, Tech., Eng., and Math Teacher Preparation, \$999,666, 2003-07.
7. 2004-05 Louisiana Systemic Initiatives Program and Louisiana Gaining Early Awareness and Readiness for Undergraduate Programs Professional Development (J. Madden, F. Neubrandner). Establishing Long-Term On-Site Academic Support Systems. \$499,500 total for 2004-07; \$166,500 for 2004-05. Continuation funding for 2005-07 will be contingent upon positive annual reviews.
8. Louisiana Department of Education Math and Science Partnership Program, J. Marionneaux, N. McAnelly F. Neubrandner. Iberville Parish/LSU-BR/SU-BR Mathematics Partnership Program. \$449,523 total for 2004-07, with \$149,841 for 2004-05. Funding for 2005-07 will be contingent upon positive annual reviews.
9. Louisiana Department of Education Math and Science Partnership Program, H. Brister, P. Smack, N. McAnelly F. Neubrandner. East Baton Rouge/LSU-BR Mathematics Partnership Program. \$449,872 total for 2004-07, with \$149,957 for 2004-05. Funding for 2005-07 will be contingent upon positive annual reviews.
10. Louisiana Education Quality Support Fund (LEQSF) (J. Meyinsse, F. Neubrandner). Enhancement of Advanced Placement Opportunities. \$88,527, 2004-05.
11. NSF EHR—0087892. Course, Curriculum and Laboratory Improvement, \$74,831, 2001-03.
12. National Science Foundation (NSF CCLI-Adaptation and Implementation 99-53) (J. Madden), Using the LaCEPT Model to Reform an Elementary Statistics Course, \$74,063, 2000-2003.
13. Louisiana Systemic Initiatives Program (LaSIP 1302LSUBR) (J. Madden, F. Neubrandner) Assessing Standards-Based Learning in K-5 Mathematics (A LINCS Professional Development Workshop for K-5 Teachers in East Baton Rouge. \$147,320, 2002-03.

The writing of successful outreach proposals is a time-intensive process that requires the coordination of many diverse interests. Very often, months of hard work lead to a proposal which is then ultimately rejected. Examples of large-scale projects which have been rejected are:

1. NSF 03-532 (DGE – Grad Teaching Fellows in K-12) (Su-Seng Pang, F. Cartledge, F. Neubrandner, Connie Stelly, Isiah Warner) Track 1, GK-12: LSU Strategic Mentoring Model for Teaching Fellows in K-12 Education, \$1,858,347, 2004-2007.
2. NSF 02-190 (K. Davidson, D. Bagayoko, F. Cartledge, J. Machen, F. Neubrandner). South Louisiana Math and Science Partnership. \$12,470,940, 2003-2008.
3. U.S. Department of Education, Fund for the Improvement of Postsecondary Education (FIPSE), F. Cartledge, F. Neubrandner, Recruiting Subject Matter Majors at LSU into Secondary Teaching, \$587,340, 2003-06.
4. NSF, I. Warner, C. Collins, M.J. Collins, P. Egbelu, F. Neubrandner, H. Silverman, M.Blackwell, ADVANCE Institutional Transformation Award: LSU Strategic Model for advancing female faculty in STEM Disciplines. \$3,690,085, 2003 – 08
5. Louisiana Board of Regents DEI Grants program – SELECT (M. Davidson, R. Estrada, F. Neubrandner) Mathematics ... at a Distance. \$49,643, 2003.
6. NSF 01-114 (I. Warner, F. Cartledge, F. Neubrandner, S. Pang, C. Stelly). GK-12: LSU/SU Strategic Mentoring Model for Teaching Fellows in K-12 Education. \$1,500,000, 2002-05.

Looking in detail at the grant objectives, we acknowledge that in response to the configuration of opportunities that we actually met (as opposed to those we had projected), there were adjustments in how efforts were allocated. Some of the sub-projects identified in the original proposal moved ahead of their anticipated schedules. A few were simply maintained but not aggressively advanced. In some cases, projects that received decreased time allocations actually exceeded targets. (The new funding we secured is an example.)

The proposal included the objective of forming an advisory council for the LSU MathVision Laboratory. This was never formally established and after becoming a sub-organization of the Cain Center, its advisory board effectively took on the role of the envisioned advisory council. In the past, the activities of the MathVision Laboratory were largely the initiative of individual faculty members with substantial additional support from the LSU Mathematics Department, the College of Arts and Sciences, and the Cain Center. This past support, in the forms it was given, was instrumental in helping the LSU MathVision Lab grow to its present size. However, as external funding crosses the \$4,000,000 mark, patterns established in the past are no longer appropriate. For sustained progress, programs of this size need further working alliances, an institutionalized structure, new goals, new benchmarks, new personnel, and additional administrative support. In the near term, therefore, the MathVision Laboratory will be reorganized to be able to sustain further growth and to further develop into Louisiana's leading provider of research-based solutions to real-world problems in mathematics education at all levels.