



**2009-2011 CUNY Office of Academic Affairs
Request for Funding Proposals
Improving Undergraduate Mathematics Learning**

Background

CUNY Central's Office of Academic Affairs is pleased to announce the availability of grant funding for the years 2009-2011. The goal of this request for funding proposals (RFP) is to support and encourage CUNY faculty to undertake evidence-based research that will lead to better learning in mathematics classrooms. The competition is an opportunity to fund faculty-led research projects and to encourage faculty members to consider questions or problems they have encountered in helping students learn mathematics, devising creative solutions or testing ones that they have read about and developing means to assess whether the solutions work.

Program Details and Eligibility

Proposed research projects can employ descriptive or experimental methods to examine hypotheses and solutions. Importantly, all proposed projects must have the potential to eventually benefit many students.

The amount of an award will be based on the scope and the extent of the proposal. **Grants will range from \$10,000 to \$100,000 each** (the latter being for proposals that have the potential to affect a great many students). All funding must be expended by June 30, 2011.

- Principal Investigator must be a full-time member of a CUNY mathematics department. Co-PIs may be part-time or full-time faculty and from any discipline.
- Multi-author and multi-campus collaborative studies are encouraged.
- Award funds can be used in the service of the following two categories:
 - **Personnel**: teaching assistants, research assistants, faculty reassigned time (paid at the adjunct replacement rate), summer salary (one month maximum per faculty member)
 - **Other Than Personnel Services (OTPS)** expenditures, such as equipment, supplies, software, and travel as related to the project.
- Proposed innovation/replication must be scalable.
- Dissemination requirements: Annual Reports on implementation and results and presentations of project and results to campus and cross-campus constituencies.

To support faculty applicants throughout this process, Central Office assistance will be provided for proposal preparation including suggestions for designing or testing instructional ideas, preparing for an Institutional Review Board application process (necessary for any research with human subjects), budget construction advice, and guidance on structuring the proposal text. However, the actual writing and compilation of the proposal must be done by the applicants.



Questions regarding this RFP may be directed to Yasemin Jones, who can be reached at yasemin.jones@mail.cuny.edu, (212) 794-5514. Potential applicants should also consult with their campuses' Grants Offices, which can be very helpful in the preparation of letters of intent and proposals.

Application Information

There is a two-step application process required for all submissions:

1. A two-page (maximum) letter of intent
2. A ten-page (maximum) full proposal

The letter of intent is due August 1, 2009

The full proposal is due October 16, 2009

Applications (letter of intent and proposal including attachments) must be submitted to: improvingmathlearning@mail.cuny.edu. Campus grants offices of the PI and any Co-PIs must be copied on all submissions.

Letter of Intent Specifications (2 pages maximum)

The Letter of Intent (LOI) should be a brief abstract of the proposed project and must include the following:

- A clear and concise statement of the specific aims of the project and the hypothesis (or hypotheses) that will be examined.
- A brief statement of the background and significance of the project.
- A brief description of the research design and methods that will be used.
- A brief description of the proposed budget.
- A draft timeline and how the data will be collected, analyzed, and interpreted.

Letters of Intent will be judged on the following criteria:

1. Responsiveness to RFP – proposed research is in the field of undergraduate mathematics learning, is hypothesis-driven, and focuses on the creation and implementation of a research design to study one or more specific hypotheses concerning student learning.
2. Significance and broader impact – proposed research has the potential to yield broad and tangible benefits for many students.

Applicants who submit letters of intent will receive feedback on their content and will be invited to attend a design workshop in early September to review the strengths of their ideas with CUNY research design consultants. This workshop will offer an opportunity to refine proposed studies prior to submitting a full proposal, and to assist prospective PIs in the preparation for a full proposal.

Full Proposal Components

All invited proposals must contain the hypothesis to be tested, a justification for the research, general and specific objectives, a section on methodology including plans to ensure ethical conduct of research involving humans, the plan of analysis of the results, and the project timetable.

Specific Proposal Requirements

1. Proposal Narrative (ten-page limit)
 - Abstract (one page maximum)
 - Specific Aims
 - Background and Significance
 - Preliminary Studies by PI/Co-PIs or by others
 - Research Design and Methods

2. Proposal Attachments (not included in ten-page limit)
 - Literature Cited
 - Timeline and work plan of proposed activities with expected outcomes
 - Budget and Justification: itemized personnel, & OTPS requests, itemized explanations, and totals.
 - Biosketches of all key personnel (2-page limit for each)
 - Letters of support from the department chair and chief academic officers of each PI and Co-PI.

Proposal Review Process

Proposals will be reviewed by a panel of mathematics faculty and central office staff. Reviewers will evaluate proposals using the following criteria:

1. **SIGNIFICANCE and IMPACT:** The extent to which the project, if successfully carried out, will make a significant and meaningful contribution to undergraduate mathematics learning at CUNY.

2. **APPROACH:** The extent to which the conceptual framework, design, methods, and analyses are properly developed, well-integrated, and appropriate to the aims of the project.

3. **FEASIBILITY:** The likelihood that the proposed work can be accomplished by the investigators, given their documented experience and expertise, requested and available resources, institutional commitment and adequacy of plans for the recruitment and retention of any subjects as well as any needed IRB approval.

Notification

Applicants will be notified of funding decisions no later than November 24, 2009. Duration of funding will be based on the proposal's timeline but no funding will extend past June 30, 2011.

A small sampling of resources to consider for possible replication or testing of various teaching/learning techniques:

Abdalkhani, J., & Menon, R. (1998). Using writing in college mathematics courses. *Journal on Excellence in College Teaching*, 9(3), 3-17.

Bonsangue, M.V. (1993). Long-term effects of the Calculus Workshop Model. *Cooperative Learning*, 13(3), 19-20.

DePree, J. 1998. Small-group instruction: Impact on basic algebra students. *Journal of Developmental Education*, 22(1): 2-5.

Fong, A.B., Huang, M. & Goel, A.M. (2008). Examining the links between grade 12 mathematics coursework and mathematics remediation in Nevada public colleges and universities. (Issues & Answers Report, REL 2008-No. 058). Washington, DC: U.S. Department of Education, Institute of Education Services, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory West. Retrieved from <http://ies.ed.gov/ncee/edlabs>

The Good Questions Project from Cornell University's Mathematics Department:
<http://www.math.cornell.edu/~GoodQuestions/>

Gordon, F. (2006). Assessing what students learn: Reform versus traditional precalculus and follow-up calculus. In Hastings, N.A., *A Fresh Start for Collegiate Mathematics: Rethinking the Courses below Calculus*, 181-192.

Hagedorn, L.S., Sagher, Y., & Siadat, M.V. (2000). Building study skills in a college mathematics classroom. *The Journal of General Education*, 49 (2), 132-55.

Nolting, P.D. (1990). The effects of counseling and study skills training on mathematics academic achievement. Pompano Beach, Florida: Academic Success Press.

Martin, A. (2008). Ideas in Practice: Graphing calculators in beginning algebra. *Journal of Developmental Education*, 31, 20-37.

Pashler, H., Bain, P.M., Bottge, B.A., Graesser, A., Koedinger, K., McDaniel, M., & Metcalfe, J. (2007). *Organizing Instruction and Study to Improve Student Learning* (NCER 2007-2004). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ncer.ed.gov> or <http://ies.ed.gov/ncee/wwc/pdf/practiceguides/20072004.pdf>

Rohrer, D., & Taylor, K. (2006). The effects of overlearning and distributed practice on the retention of mathematics knowledge. *Applied Cognitive Psychology*, 20, 1209-1224.

Smith, R. S. (1992). Spreadsheets as a mathematical tool. *Journal on Excellence in College Teaching*, 3, 131-148.

Treisman, U. (1992). Studying students studying calculus: A look at the lives of minority mathematics students in college. *The College Mathematics Journal*, 23 (5), 362-371.