

## Costs and Benefits of Undergraduate Research to Faculty and the Institution

Opportunities for undergraduates to do mathematics research have increased dramatically over the past twenty years. The National Science Foundation and the National Security Agency sponsor programs to encourage involvement in summer and regular semester programs, and individual schools have supported local efforts. The Subcommittee on Research by Undergraduates of the Committee on the Undergraduate Program in Mathematics (CUPM) feels that the community and administrators have accepted the value to the students of this research, but many administrators are not aware of the difference between this work and research by undergraduates in other fields. Administrators are encouraging departments to increase the involvement of faculty and students in research activities, but are not always aware of the costs and benefits to the faculty involved. This subcommittee wrote a document,

Mathematics Research by Undergraduates: Costs and Benefits to Faculty and the Institution,

with the goal to provide a framework for students, faculty, and administrators to follow as they seek to participate in undergraduate research activities in mathematics.

Here is an example of such a difference. “While undergraduate researchers in other disciplines often assist the project mentor in his/her own research projects, undergraduate research projects in mathematics are often created specifically for undergraduates. Thus, time spent on leading an undergraduate research project is often time taken away from the mentor’s own research endeavors. While undergraduate research is extremely beneficial to the student and to the department, it does not always advance the faculty member’s own research program.”

Of course, we note that in some projects, publications do result with significant contributions from the undergraduates involved. The benefits to the faculty have a wide range in the mathematics community, and many faculty need to be supported and rewarded for their supervision of student work. Possibilities of such support would be one course teaching reduction or a light load of service duties. Rewards might include summer salary or travel funding to visit a collaborator. This work should contribute positively to tenure and promotion decisions. Thus institutional support is a critical

component for a sustainable undergraduate research program in mathematics.

The committee's document which has been approved by the CUPM can be found at:

[www.maa.org/cupm/CUPM-UG-research.pdf](http://www.maa.org/cupm/CUPM-UG-research.pdf).

The CPUM Subcommittee on Research by Undergraduates would be glad to have input and continuing dialogue about these issues. Please contact the authors of this article with your comments.

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