

## Making Change: Sustaining Math Excellence

**Patricia B. Campbell, PhD**  
**Rosa Carson, BA**  
**Daryl E. Chubin, PhD**

*We don't look at it as an intervention anymore; it's just the way we do things.*

Lynchburg City Public School Superintendent Paul McKendrick's comment about his Math Excellence (ME) project reflects the "gold standard" of sustainability: where a project or practice found to be effective becomes common practice. Such projects and practices must be institutionalized and sustained if we are ever to reduce gaps in students' achievement and participation in mathematics and the sciences.

Sustainability has been a central goal of the ME program from its inception. Even with this emphasis, not all ME projects have had an impact on their institutions. In this brief we look at those projects whose sustainability efforts have been successful and what can be learned from them.

Of the 31 ME projects interviewed, 12 (40%) sparked change within their own institutions while another three (10%) contributed to changes in partner schools and districts. In addition, 16 ME projects (52%) are either continuing their ME activities past the funding period or have plans to do so while 22 (71%) are disseminating the teacher and student materials they developed under ME .

### Lessons Learned

#### **Working within your own institution is an effective way to facilitate change.**

Six of the 12 projects (50%) with institutional change were working within their own institutions while **none** of the 19 projects with no institutional change were. These 19 were working with teachers and/or students from other institutions. This appeared to be the major difference between projects with institutional change and those without.

#### *ME-Inspired Institutional Changes*

**Growing out of ME project work with local school districts, Clarkson College now has an office of educational partnerships, in the provost's office, to provide infrastructure and support for K-12 outreach.**

**Smith College now includes training specific to the teaching of engineering in their teacher training program.**

**In Duke University's new engineering building there is space allocated for ME and other K-12 activities including on-site camps and student field trips to the engineering school.**

**Results from ME and other efforts, led to Morgan State University developing a new engineering student services center and institutionalizing their freshman mentoring program.**

*Making Change* is one of a series of lessons from the GE Foundation's Math Excellence Evaluation, a 5-year grant awarded in 2001 to the National Action Council for Minorities in Engineering, Inc. The principals in this effort are Daryl E. Chubin, now Director of the Center for Advancing Science & Engineering Capacity at the AAAS, and Patricia B. Campbell of Campbell-Kibler Associates. "Lessons from Math Excellence" can be downloaded from [www.campbell-kibler.com](http://www.campbell-kibler.com), and [www.nacme.org/news/publications.html](http://www.nacme.org/news/publications.html). Math Excellence resources can be downloaded from [www.ge.com/foundation/resources.html](http://www.ge.com/foundation/resources.html). Inquiries should be directed to [campbell@campbell-kibler.com](mailto:campbell@campbell-kibler.com).

**In working with partners, establishing explicit goals together is key to change.**

While 26 ME projects (81%) worked with partners from other institutions, in only three cases did any of the partners experience institutional change. In two cases, with ME project help, partner schools introduced and institutionalized honors math and engineering courses. In both cases, helping the schools to establish ongoing courses was a project goal. Both projects worked extensively and intensively with one high school at a time and both changed their proposed strategies and activities to better meet the needs articulated by the data and by partner teachers and administrators.

The third case of partner change was quite different. The project was a comprehensive one with many partners, involving teachers and students at many levels. With ME project help, two participating districts set up and institutionalized student summer math courses to prepare students who would otherwise not have been eligible for Algebra.

**Establishing and modifying courses are the most common institutional changes.**

Seven of the 12 (58%) institutional changes focused on courses. In most cases, the course introduction or change was a tool more than an outcome. For

***ME-Related Changes in Collaborations***

**At North Carolina State University engineering and education students now take courses together giving them chances to work together and discuss ideas and methods. The College of Education erected a building at a partner middle school and now some of the ME project's engineering graduate students have offices there.**

**At five other institutions, ME projects are credited with stimulating faculty and student conversations in different schools and departments where none occurred before.**

***ME-Instituted Course Changes***

**Boston College's partner high school now offers their students seven honors math courses.**

**Duke University engineering students can now receive course credit for working with elementary students and teachers.**

**Lynchburg City Public School high school students can take combined double period Algebra and Geometry courses, allowing the option of moving into accelerated math tracks in 9th or 10th grade.**

**To increase retention, Morgan State University engineering students now take mathematics courses in a different sequence, completing Pre-calculus prior to taking the required Chemistry course.**

**Ohio State University's two partner high schools now offer and teach their own Exploring Engineering courses.**

**Penn State revamped their teacher training methods course to include ME project engineering related activities.**

**Smith College now offers a course in the Teaching of Science, Engineering, and Technology.**

example, Exploring Engineering courses were established to increase the number and diversity of students majoring in engineering while establishing high school honors courses and double-period high school math courses was a way to allow more students to move on to advanced mathematics courses in high school.

**Conclusions**

The evolution of an innovative practice into "the way things are done" is a slow and arduous process requiring participants to gain comfort, confidence, and "ownership" of the practice. These conditions institutionalize "what's new" and make change habitual. The GE Foundation's Math Excellence projects spurred precisely this process, though in various ways that accommodated local context and needs. One size seldom fits all.



80 Lakeside Dr  
Groton, MA 01450  
www.campbell-kibler.com

March 2006



440 Hamilton Ave, Suite 302  
White Plains, NY 10601-1813  
www.nacme.org