WHAT WORKS

Project Kaleidoscope asserts that the most important attribute of undergraduate programs that attract and sustain student interest in science and mathematics is a thriving "natural science" community of students and faculty.

Such natural science communities offer students a learning environment that is demonstrably effective, where:

- *Learning is experiential, hands-on, and steeped in investigation from the very first courses for all students through capstone courses for science and mathematics majors.*
- *Learning is personally meaningful to students and faculty, makes connections to other fields of inquiry, is embedded in the context of its own history and rationale, and suggests practical applications related to the experience of students.*
- *Learning takes place in a community where faculty are committed equally to undergraduate teaching and to their own intellectual vitality, where faculty see students as partners in learning, where students collaborate with one another and gain confidence that they can succeed, and where institutions support such communities of learners.*

Programs organized around these guiding principles motivate students and give them the skills and confidence to succeed. Thus empowered, students learn science and mathematics.

—Project Kaleidoscope, Volume I

The stories on *what works* in this chapter and throughout the Handbook illustrate how faculty on campuses across the country have come to understand how to build better environments for learning. They tell of faculty who have analyzed advances in the disciplines and in technology and who recognize how those advances call for a reexamination of the present culture of teaching and learning in the sciences and mathematics. These stories tell how faculty have made choices about what is to be taught and what does not need to be taught—choices required by the ever-expanding body of knowledge and the increasing sophistication of technologies available for use at the undergraduate level. These stories witness to the power of the process of arriving at an institutional commitment about mission, priorities, and strategies. Most important, these stories reveal how learning is enriched when students take responsibility for constructing their own knowledge.