

Sustaining inclusiveness in undergraduate STEM education through dispersing faculty and peer mentoring opportunities

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At Williams College, dispersed responsibility for mentoring students in classrooms and research laboratories forms the foundation of our comprehensive STEM inclusion program. Our dispersive model is pointedly decentralized, or multiply-centered, in order to avoid negative faculty reactions to top-down initiatives and to build a strong potential for sustainable change. Our “bottom-up” approach, beginning with individual faculty members and with targeted peer mentoring in the freshman year, may provide a template for initiating inclusive STEM programs at other institutions.

Our road to innovation and success began with sobering data about the attrition of African American and Latina/o students from our biology and chemistry curricula. These data led to the formation of a faculty/staff reading group that produced an influential 2-page “best practices” report. We continue to widely and regularly distribute this report to the full faculty, including those in the humanities and social sciences. High-profile campus visits by two renowned scientists who are also national experts on diversifying undergraduate science programs, Michael Summers (University of Maryland-Baltimore County) and Isiah Warner (Louisiana State University), garnered a different type of attention from Williams faculty and administrators because these scientists successfully intersect STEM inclusion work with their own excellence in research, teaching, and mentoring.

Faculty soon began consciously inviting students from underrepresented minority (URM) groups to join all available peer leadership, peer tutoring, peer teaching, and research endeavors. A humorous and helpful short video, “How to Talk to Your Professors”, was shown in introductory STEM courses to break down barriers between students and faculty. Two new peer mentoring programs were begun: BioMentors and Purple Mountain Scholars. BioMentors matched first-semester biology students with upperclass mentors who provided insider information on thriving in a demanding laboratory/discussion/lecture course. Purple Mountain Scholars provided the same type of “social capital” mentoring to students across the college, including many STEM students. Faculty began recruiting first-year and sophomore URM students as paid summer research interns. An effective strategy was undertaken by the biology department, which aimed to achieve 100% participation by faculty in URM research, mentoring, and outreach activities.

In working toward racial and ethnic inclusivity in STEM, we have consciously intersected with existing strengths at Williams, such as our 20+-year summer science bridge program, exemplary faculty mentors of URM students in chemistry, and multiple administrative offices with strong mentoring and academic support components (offices of admission, academic resources, dean of the college, and special academic programs).

One dimension of an inclusive STEM program is retention of students in STEM majors. Data for such a measure are usually readily attainable from the registrar. Some of our data are displayed below.

(over)

Gender and race/ethnicity composition of biology and chemistry majors at Williams College, comparing the last two graduation classes with a 2001-2004 baseline.

	Graduation year	% female	% African American	% Caucasian	% Latina/o	% Native American	% Non-resident alien
All graduating Williams students	2001-2004 (baseline)	49	6.4	73	6.2	0.24	5.7
	2008	51	9.8	67	8.7	0	5.3
	2009	52	8.9	65	9	0.6	6.1
Graduating biology majors	2001-2004 (baseline)	65	2.0	78	3.0	0	2.9
	2008	65	<b>9.7</b>	65	<b>9.7</b>	0	0
	2009	63	<b>8.8</b>	65	<b>11</b>	1.8	3.5
Graduating chemistry majors	2001-2004 (baseline)	45	<b>11</b>	67	2.2	0	7.2
	2008	46	3	55	<b>12</b>	0	9
	2009	47	<b>14</b>	50	<b>8.3</b>	0	5.6

Reiteration of our beginning steps – data assessment, learning about best practices, and inviting URM students to join peer leadership and research endeavors – fuels our continuing efforts to build and sustain an inclusive undergraduate STEM program.

#### Resources:

**2-page “Best Practices” report, entitled “Tips on Effective Mentoring”:** Google “Williams College” “effective mentoring” to find google doc.

#### **6 influential articles for a reading group:**

<http://www.williams.edu/biology/divsciences/?n=Articles>

**“How to talk to your professors” video:** a humorous way to disperse social capital about college expectations for faculty-student connections.

<http://www.williams.edu/Biology/bio101survival/>