



Within Our Sights: Toward National Leadership in Higher Education | October 18, 2013
Morning Panel Presentation
STEM Initiatives in Massachusetts Higher Education Institutions

Presenter Contact Information

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Campus Project

STEM Pathway Project

The objective of the @ Scale STEM Pathways Project (SSPP) at Massachusetts College of Liberal Arts (MCLA) is to provide a model which can be employed to increase the number of STEM graduates and address the needs of the Commonwealth. SSPP provides opportunities for undergraduate students to excel in science and mathematics fields and prepare them to enter the workforce or to enroll in graduate programs. MCLA's Pathways Project has been designed to provide strategic and successful initiatives which address students' academic, experiential, and career awareness interests. The SSPP model builds on the work of the Berkshire STEM Pipeline network, and provides a nationally recognized academic support system, mentoring, experiential learning, and state-of-the-art technology to improve student success, as well as targeted faculty development. The model is scalable and can be adopted to maximize enrolled students' interests and ultimate success, to prepare students for high demand STEM careers, and thus to contribute to the State's vibrant STEM economy. MCLA's SSPP employs a STEM retention plan that includes activities and interventions from freshman through senior year to increase graduation of STEM majors. Housed and administered in the Center for Student Success and Engagement (CSSE) and STEM Programs Office at MCLA, the program highlights the importance of academic support, advising, and career planning, and marshals the efforts of both academic affairs and student affairs divisions to promote student success. In brief the SSPP provides a comprehensive approach to increase postsecondary graduation and engage students with a full array of STEM partners. The Pathway Project supports Supplemental Instruction, STEM Associate, and Internship stipend expenses – components found at MCLA and nationally to be highly effective in supporting STEM student graduation.

Vision Project Outcome Areas

- ✓ **College Participation**
- ✓ **College Completion**
- ✓ **Student Learning**
- ✓ **Workforce Alignment**

Research and Data

Project Duration: *January 2013 - January 2014*

- Increase in STEM tutoring on MCLA's campus
- Supplemental Instruction is employed nationally for success in student learning gains
- Student, faculty, and staff focus groups to discuss best practices on campus



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Campus Project

STEM & Health Pathways Center

The Pathways Center was developed as a result of some of the successes reported by other colleges who participated in the Achieving the Dream, and the Breaking Through initiatives. The center offers all Health & STEM students a variety of support services focused on academic achievement and successful career outcomes. This model as with the Achieving the Dream and the Breaking Through initiatives provides comprehensive support services aimed at connecting students with an array of academic and nonacademic supports. The center uses an umbrella concept for all the support services to ensure ease of access. As the director of the center, I also serve as an achievement coach, providing intrusive advising, identifying the needs and developing/coordinating services and activities in the center to meet those needs. The Pathway Center services include the following:

Academic Support

- Tutoring (individual & group)
- Supplemental instruction
- Academic advising
- Study groups
- Study space
- Laptop sign-out

Career Services Support

- Resume and cover letter writing
- Interview coaching
- Job-search strategies
- Job postings

Placements

- Internships
- Externships
- Research Experience for Undergraduates (REU)

Health & STEM Activities

- Summer Bridge Program
- Career-related field trips
- Industry-specific workshops
- Networking events

Peer Achievement Mentoring

Our project is new and so we have no hard data yet, but we have had seen some preliminary, qualitative successes. The data below is from the Achieving the Dream Initiative.

Vision Project Outcome Areas

- ✓ **College Participation**
- ✓ **College Completion**
- ✓ **Student Learning**
- ✓ **Workforce Alignment**
- ✓ **Preparing Citizens**
- ✓ **Closing Achievement Gaps**
- ✓ **Research**

Research and Data

Project Duration: *April 2013 - No end date*

- Central Piedmont Community College increased student course completion rates for all students from 65% in Fall 2007 to 72% in the Fall 2011, and term-to-term retention for IPEDS students from 69% in Fall 2006 to 83% in Fall 2011 partially based on the implementation of a case management advising system
- Springfield Technical Community College increased fall to spring retention rates for the Achieving the Dream cohort students from 69% in 2008-2009 to 77% in 2011-2012. This improvement is associated with the college's Intrusive Advising model.
- Temple College increased the course completion rates of developmental students from 53.8% in 2007-08 to 56.1% in 2011-2012.
- This increase is associated with the creation of a centralized student success division.
- Trident Technical College increased developmental and gateway math course completion from 40.3% in 2006 to 44.9% in 2011. Successful completion of developmental courses has increased from 35.4% in 2006 to 40.3% in 2011. These improvements are associated with providing more support both in and outside the classroom.



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Campus Project

UMass Boston College of Science and Mathematics: Increasing the Numbers and Diversity of STEM Graduates

Retention and graduation rates are of national concern in the US, particularly in STEM disciplines, since current data show them to be below those in other fields. The College of Science and Mathematics (CSM) at UMass Boston is a minority-majority college with large numbers of first generation and low-income students. We have experienced a 400% increase in freshman enrollments during the past six years. In light of our commitment to our public research university mission, we developed a strategic priority to increase the diversity as well as the number of Science, Technology, Engineering, and Mathematics (STEM) graduates. We revamped advising, academic support, and orientation strategies, and incorporated a major-centered, co-enrollment cohort approach (Freshman Success Communities) as the centerpiece of our strategy. The FSC's launched in Fall 2009, with 46 students in two cohorts, and have grown to 13 communities for Fall 2013, serving nearly 60% of incoming freshmen. FSC retention is 89%, more than 10 points higher than UMass Boston overall. Students complete, on average, a full year of STEM courses with mean GPAs over 2.9. These results are persistent; over 70% of upper division FSC students remain enrolled, predominantly in STEM majors, and on-track for timely graduation. The 4-year graduation rate for the first cohort of FSC students was 41%, already equivalent to the average national 6-year graduation rate in STEM; an additional 25% of the group are still enrolled and moving towards graduation within the next year. Based on our projections from these data we anticipate a dramatic transformation of our historic degree completion rates.

Vision Project Outcome Areas

- ✓ **College Completion**
- ✓ **Closing Achievement Gaps**

Research and Data

Project Duration: 2009 - present (ongoing)

- CSM is a minority-majority college with 56% of minority representation; Freshman Success Communities (FSC) - 60% of minority students
- Started with 2 FSCs serving 46 (16%) freshmen; currently - 13 FSCs serving 260 (60%) freshmen
- Since 2009 CSM's retention increased from 73% to 83%, FSC retention is 89%
- In Fall 2013 81% of students remain enrolled and on track for 4-year graduation
- Students on average have completed 93% of necessary credits to graduate in 4 years with an average GPA of 2.86
- 100% of surveyed FSC program participants confirmed that they would choose to join FSC if there were to do it again