Designing Support Programs to Increase Retention and Graduation Rates among STEM College Students

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Presentation Outline

- Introduction
- Overview of student programs
- Successes
- Challenges
- Lesson Learned
- Future work

Seven Skills

- Think critically and solve problems
- Collaborate effectively with others
- Communicate effectively
- Be thoughtful and engaged readers
- Access and analyze information
- Adapt readily
- Understand that you are a part of a larger community

How do undergraduate students gain these skills?

- Curricular Activities
  - Course projects
  - Course-based undergraduate research experiences (CURES)
  - Senior design/capstone projects
  - Etc.
- Co-curricular Activities
  - Internships
  - Co-operative education experiences
  - Undergraduate research experiences
  - Professional societies, clubs, etc.

But what about for the student attending a 2-year institution or enrolled in a 2-year degree program?

Background

- PC STEM Office launched in 2012 with a goal to provide college-wide leadership for STEM-related activities.
  - As a result of new externally funded grants
    - USG STEM II Initiative
    - Four NSF-funded grants
- Across 5 campuses

Student Programs

- USG STEM II
  - MESA
- NSF
  - BreakThru
  - ENLISTEM
  - PSLSAMP
  - STEP
- Nearly 300+ STEM students annually
- Over 50 activities, 10 full-time faculty (5/4 teaching load)

Common Themes

- Focus on diversifying and extending the STEM pipe-line
  - U.S. Citizen, Permanent Resident, National, or Refugee
  - STEM discipline
  - Enrolled full-time
  - Minimum GPA requirements
  - College-level courses

USG STEM II INITIATIVE

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Mathematics, Engineering Science Achievement (MESA)

- Established at PC in 2006 as part of a country-wide initiative to improve STEM student success
- Provides support for students so they can excel in STEM and graduate with baccalaureate degrees.
- Support:
  - Academic Excellence Workshops (AEW)
  - Academic advising/counseling
  - Assistance with the transfer process to a 4-year institution
  - Career advising
  - Summer research/internship opportunities

MESA Mathematics Engineering Science Achievement

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MESA, cont.

- Active participation includes:
  - Spend a minimum of 7 hours per month in the MESA Center (Clarkston Campus)
  - Attend at least 7 AEWs during the semester
  - Maintain a minimum cumulative GPA of 2.5.

Table 6. General MESA Statistics	
	Total Scholars
Majors	
Biology	24
Chemistry	16
Computer Science	26
Engineering	63
Mathematics	5
Physics	1
Classification	
Freshman	61
Sophomore	74
Cumulative GPA	
GPA ≥ 3.5	60
3.0 ≤ GPA < 3.5	38
2.5 ≤ GPA < 3.0	27
2.0 ≤ GPA < 2.5	9
GPA < 2.0	1
Transfer/Graduation	28 (AY 2014-2015)

MESA, cont.

- Returning students comprise approximately 72% of the MESA Scholars each year, slightly higher than STEM students retained at Perimeter College (69%) and also STEM students retained in a STEM discipline at Perimeter College (62%).
- A 55.55% increase in graduation and/transfer from AY 2013 to AY 2014
- MESA scholars typically graduate/transfer at a higher rate than non-participants

MESA Mathematics Engineering Science Achievement

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NATIONAL SCIENCE FOUNDATION

BreakThru

- Increase the number of students with disabilities
- Collaboration with UGA and GA Tech
- Used virtual reality
  - Introduced to the range of communication methods
  - Received mentoring

ENLISTEM

- Education and Nurture Leadership in Science, Technology, Engineering and Mathematics Scholarship Program
- Provides improved educational opportunities for students by improving student support programs for STEM participants and by removing financial barriers that higher education often presents.
- You must be eligible for Federal Financial Aid as defined on the FAFSA.
- Awards scholarships up to $5000.00

ENLISTEM, cont.

- Assigned a personal faculty mentor to monitor your progress and provide individualized support and guidance
- Participate
  - STEM Learning Clusters and STEM related activities including career discussions, field trips to STEM organizations, industry tours, etc.
  - STEM seminars and Academic Excellence Workshops.

- Over $530,000 in scholarships were awarded to 102 students
- 64% of whom have already graduated and/or transferred to 4-year institutions

PSLSAMP

- One of seven institutions in the Peach State Louis Stokes Alliance for Minority Participation (PSLSAMP).
- The goal is to increase the number of under-represented minority students statewide who complete undergraduate degrees in STEM

PSLSAMP, cont.

- National Model
- Annual conference
- Bridge to the Doctorate

STEP

- Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP)
- Increase the number of students (U.S. citizens or permanent residents) receiving associate or baccalaureate degrees in established or emerging fields within STEM.
- Has a specific focus on undergraduate research

STEP, cont.

- 100% of program participants either transferred to a 4-year institution or graduated with an AS degree
- 58% of program participants who enrolled at a 4-year institution have now graduated with a STEM degree;
- 4 students from the first cohort are now enrolled in STEM graduate programs
- 83% of participants presented at a STEM-related conference
- 71% of participants were able to secure a REU after program

General Program Successes

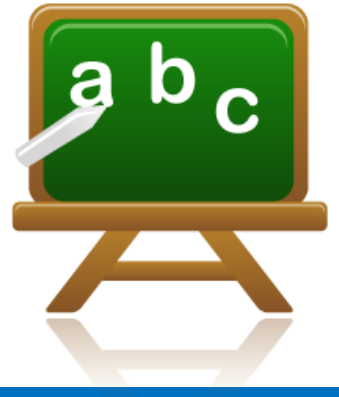
- Number of students participating in STEM co-curricular programs has increased each year since 2012 by 15%
- 96% of the FY 2013 STEM Cohort participating in STEM co-curricular programs were retained, compared to 69.5% STEM students not participating
- The 3-year graduation rate for STEM students participating in STEM co-curricular programs was 12.5% compared to 6.3% of STEM students not participating
- In FY 2014 a total of 29 activities were held which is an increase of 31% from the 22 activities held in FY 2013 and a 175% increase from the 8 activities held in FY 2012

Challenges

- Accessibility
- Data collection
- Paperwork (i.e., student forms, stipend forms, etc.)
- Institutionalization
- Sustainability (REU, student stipends, faculty involvement)

Lessons Learned

- Program growth takes time
- Strategic partnerships are key to successful outcomes
- Program redesign ≠ failure



Future Work

- Increased focus on the graduation/transfer rate of MESA scholars
- *I Am STEM* – NSF-funded program
- Incorporate the undergraduate research experiences of STEP into Course-based Undergraduate Research (CUREs)