



Western Michigan University
ScholarWorks at WMU

Academic Leadership Academy

Office of Faculty Development

2013

S-STEM Scholars, a Second Generation: Support for At-risk Upper Division and Transfer Students in CEAS

Andrew A. Kline

Western Michigan University, andrew.kline@wmich.edu

Betsy M. Aller

Western Michigan University, betsy.aller@wmich.edu

Follow this and additional works at: https://scholarworks.wmich.edu/acad_leadership



Part of the Chemical Engineering Commons, and the Industrial Engineering Commons

WMU ScholarWorks Citation

Kline, Andrew A. and Aller, Betsy M., "S-STEM Scholars, a Second Generation: Support for At-risk Upper Division and Transfer Students in CEAS" (2013). *Academic Leadership Academy*. 35.

https://scholarworks.wmich.edu/acad_leadership/35

This Poster is brought to you for free and open access by the Office of Faculty Development at ScholarWorks at WMU. It has been accepted for inclusion in Academic Leadership Academy by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.





S-STEM Scholars, a Second Generation: Support for At-risk Upper Division and Transfer Students in CEAS



Andrew A. Kline and Betsy M. Aller
WMU College of Engineering and Applied Sciences

The S-STEM Scholar Program at WMU

Background on Program

Begun in 2010, the S-STEM Scholar Program increases opportunities for financially needy but academically talented students. These students:

- Are first-time, first year students
- Demonstrate financial need through FAFSA applications
- Will enter a major in the College of Engineering and Applied Sciences
- Have a math ACT of 24 or above

Student awardees receive up to \$3,000 per semester, and continue to receive this amount for up to eight semesters with continued academic success and progress to degree.

Majors Eligible to Apply for an S-STEM Scholar Award:

| | |
|--|----------------------------|
| Aeronautical Engineering | Paper Science |
| Chemical Engineering | Paper Engineering |
| Civil Engineering | Engineering Design Tech. |
| Computer Engineering | Engineering Mgmt. Tech. |
| Construction Engineering | Manufacturing Engrg. Tech. |
| Electrical Engineering | Computer Science |
| Mechanical Engineering | Engineering - Undecided |
| Industrial and Entrepreneurial Engineering | |

S-STEM Program Objectives and Research Questions

S-STEM Scholar Program objectives are:

1. To provide scholarships so recipients can devote full-time attention to academic studies and participate in student development activities without outside employment distraction, and
2. To provide professional development activities to connect scholarship recipients to other students and faculty, and to the engineering and applied sciences professions.

S-STEM Scholar Opportunities

S-STEM Scholars choose one of three professional development opportunities when they apply to the program; students can switch each new academic year if they wish:

1. Undergraduate research: Students learning engineering through experience and develop the habits and skills of a researcher. S-STEM Scholars get help finding an undergraduate research project but are expected to also be proactive in seeking such projects.
2. Student organizations of professional societies: Scholars are expected to join and be active participants in at least one of 34 such organizations on campus.
3. Chosen mostly by 2nd-year students and later, an excellent option for students to gain on-the-job experience, connect learning in the classroom to professional practice, and develop communication, teamwork, and leadership skills.

STEM Scholars Opportunities: Research

Current S-STEM scholars have presented several conference papers and participated in research conferences. The group below attended American Society for Engineering Education (ASEE) North Central conference at Ohio State, April 2013.



S-STEM Scholar Publications and Conference Presentations

G. Maxwell, O. Munoz, N. St. Louis, B. Aller, A. Kline, and I. Abdel-Qader "Building to Learn and Learning to Build: The Baja Experience," ASEE North Central conference, April 2013, Ohio State University, Columbus, OH.

J. Vermeersch, A. Kline, B. Young, and B. Aller, "Bioprocessing Fermentors Assembly," Extended Abstract for ASEE North Central conference, April 2013, Ohio State University, Columbus, OH.

T. Bayne, S. Hoin, P. Ari-Gur, M. Hassan, P. Thannhauser, R. Rabiej, P. Ikonov, D. Lytinski, A. Kline, and B. Aller, "Creating Interactive Video Game Simulations of Engineering Labs," Extended Abstract for ASEE North Central conference, April 2013, Ohio State University, Columbus, OH.

STEM Scholars Opportunities: Professional Societies



Oscar Munoz, 3rd year S-STEM Scholar, with the Society of Automotive Engineers (SAE) Baja Car following their 7th place finish in the Backwoods Baja national competition, October 2013. Oscar joined SAE as his S-STEM Scholar student professional activity.

Phase I: Results of S-STEM Scholars Program

From Fall 2010 through Fall 2013, the S-STEM Scholar Program provided scholarships to 33 CEAS students, for a total of over \$300,000. Of these 33 students:

- 22 have been retained in the CEAS and in the S-STEM Program
- 2 have been retained in the CEAS but did not meet GPA requirements (>2.75) to continue in S-STEM Scholars
- 2 are retained at WMU but in non-STEM majors
- 2 were no longer financially in need
- 1 transferred from WMU
- 1 left WMU for unknown reasons
- 3 have left WMU for poor academic performance

Thus, 79% of S-STEM Scholars have been retained in the College of Engineering and Applied Sciences (CEAS). In comparison, the CEAS STEP Program (supports retention of 1st- and 2nd-year students) had 62.2% retention after Year 1, and 49% retention after Year 2, for students starting in 2010.

Phase II: At-risk and Transfer Students

Research as well as faculty experience with the ongoing MI-LSAMP (Louis Stokes Alliance for Minority Participation) program has shown that students often hit a financial roadblock by their junior or senior year, causing them to work more and take fewer credit hours. This can delay time to degree, or they may not finish at all.

Phase II proposes to focus on junior- and senior-level students who have shown commitment to STEM majors and show financial need. Another main goal is to focus on diversity and less traditional students, which includes transfer students.

Partners in the Phase II proposal will include MI-LSAMP, the WMU Admissions Office, and the CEAS Advising Office. MI-LSAMP has partners with nine community colleges and will provide networking opportunities to identify and attract quality candidates.

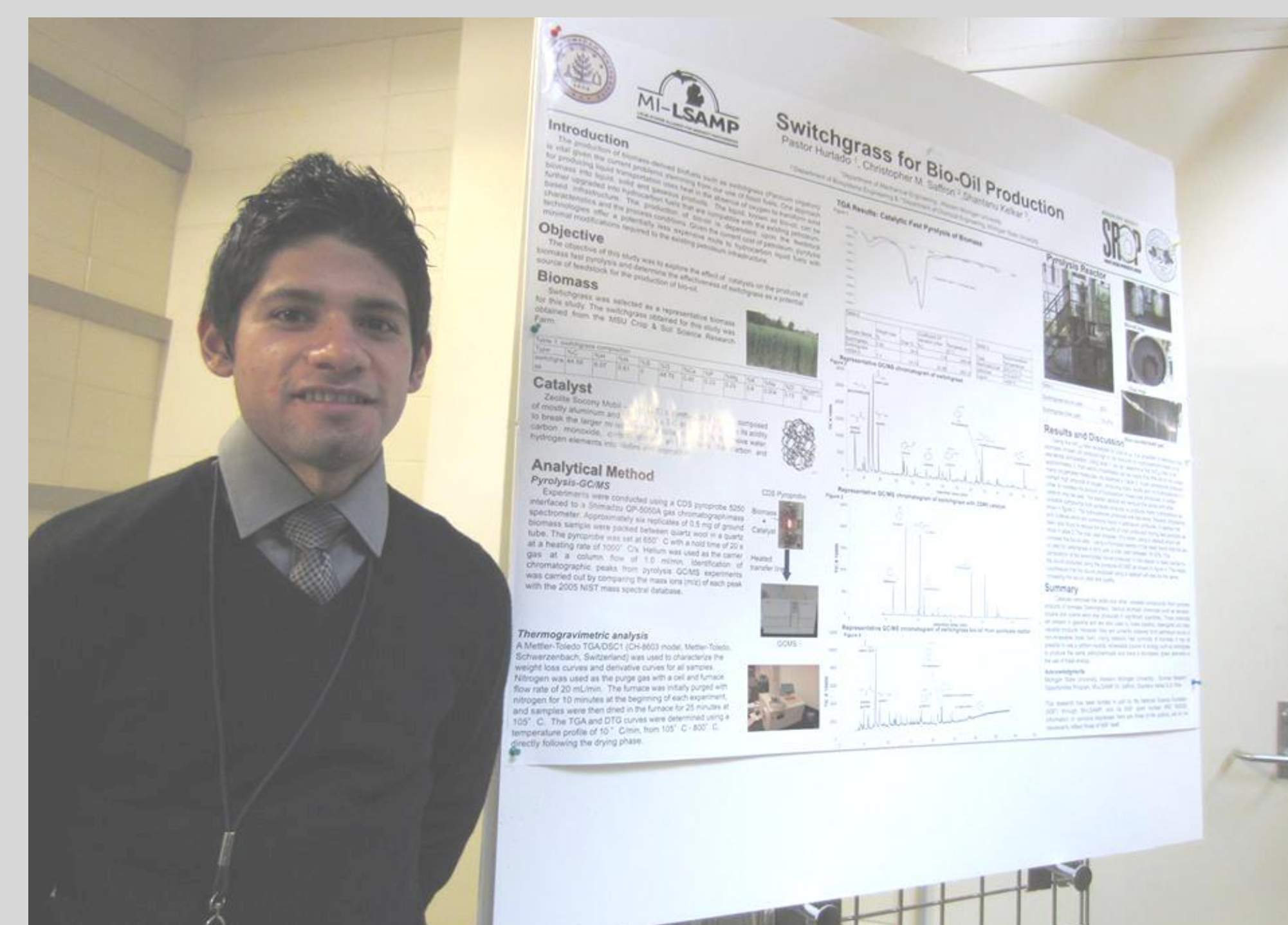
Table 1 shows the demographic target or potential head count for Phase II of the S-STEM Scholars Program. Note the differences between admitted students and actual enrollments in CEAS for under-represented minorities (URM).

Table 1. CEAS Student Demographics

| | Fall 2010 | Fall 2011 | Fall 2012 |
|---|-----------|-----------|-----------|
| Total undergraduates enrolled ¹ | 2,235 | 2,297 | 2,208 |
| Newly admitted first-year URM students ² | 171 | 183 | 142 |
| Newly enrolled first-year URM students ³ | 85 | 98 | 89 |
| Freshman and sophomore URM enrolled ³ | 161 | 170 | 164 |
| Junior and senior URM enrolled ³ | 156 | 161 | 177 |
| New transfer students enrolled from 2-year community college ¹ | 114 | 144 | 143 |

Sources:

- ¹ WMU Office of Institutional Research, **Fact Book** for appropriate year.
- ² CEAS STEP First-year Program, May 2013, Year 4 Programmatic Retreat materials.
- ³ WMU Office of Institutional Research, **Year End Summary Reports** for MI-LSAMP program. Report end date of June 30, 2011 for Fall 2010; June 30, 2012 for Fall 2011; June 30, 2013 for Fall 2012.



Phase II Timeline

| | |
|--|--------------------|
| Proposal submission: | August 2014 |
| Funding approval: | March 2015 |
| Awarding of first scholarships: | Fall 2015 |



Summary: S-STEM Success and Future

The goal of the S-STEM Scholar Program is to enhance the retention and graduation rates of academically talented but financially needy students, and to prepare them to successfully enter the engineering and applied sciences professions or to continue in graduate studies. Phase I results show increased retention of targeted students over their peers. Phase II proposes to extend program opportunities to upper-level students committed to their STEM majors and own professional success.



Contact Information, Acknowledgements, and Disclaimer

Andrew A. Kline, PhD
Dept. of Chemical and Paper Engineering, WMU
Andrew.kline@wmich.edu; 269.276.3516

Betsy M. Aller, PhD
Dept. of Industrial and Manufacturing Engineering, WMU
Betsy.aller@wmich.edu; 269.276.3354

Support for the S-STEM Scholars Program at WMU has been received from the National Science Foundation (NSF) under S-STEM Grant 0965962. Any opinions, findings and conclusions, or recommendations expressed are those of the author(s) and do not necessarily reflect the views of NSF.