SUNY Poly's S-STEM Scholar Initiative

"Supporting Degree Completion in Engineering and Engineering Technology Programs through Experiential Learning and Self-Directed Professional Development"

~Professional Seminar Feedback Survey~

A Brief To:

SUNY Poly

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Inspired Social Research & Program Evaluation

Introduction

In Fall 2022, SUNY Polytechnic Institute (SUNY Poly) contracted with Dr. Megan Mullins and her team of evaluators to conduct evaluation activities for SUNY Poly's newly awarded National Science Foundation funded S-STEM Scholarship program titled *"Supporting Degree Completion in Engineering and Engineering Technology Programs through Experiential Learning and Self-Directed Professional Development."* The long-term goal of this program is to break down barriers to degree completion within the programs of Civil Engineering, Civil Engineering Technology, Mechanical Engineering, and Mechanical Engineering Technology (CME&ET). In pursuit of this goal, SUNY Poly will provide a total of 65 one-year scholarships to 20 unique students in CME&ET. Students selected as Scholars will include both first year and transfer students. Over the grant period, this program will provide the following:

- "Know One Be One" recruitment experience for interested high school students,
- S-STEM scholarships to 20 unique students through degree completion,
- An S-STEM First Year Experience Course,
- One-on-one academic advisement and mentoring for S-STEM scholars,
- Mobius subscriptions for 1st year S-STEM scholars for Math skills support,
- S-STEM Seminar and Workshop series,
  S-STEM Scholars professional development fund,
- Experiential learning opportunities for Scholars, and
- FE Review course, purchase of FE review materials for independent study, and supports to increase student completion and passing of the FE exam.

The report below summarizes results from a survey distributed to Scholars in Cohort 1 of SUNY Poly's S-STEM program during the Fall 2024 semester. The questionnaire collected information regarding Scholars' required professional seminar attendance, including which seminars were attended, key takeaways, overall satisfaction, and recommendations for improvement. A total of eight Cohort 1 Scholars responded to the survey. The results presented in this report can help organizers understand the impact of the seminar requirement and inform ongoing program implementation moving forward.

Survey Results

As shown below, Scholars attended a wide range of professional seminars during their first semester at SUNY Poly, with the Graduate School Preparation and Smart Infrastructure for Sustainable Roads seminars seeing the highest attendance among scholarship recipients. Although not shown, all Scholars attended at least two seminars throughout this period, with two reporting attendance at three seminars and one reporting attendance at four (see next page for examples).

Seminars Attended:

Graduate School Preparation (n=3)

Smart Infrastructure for Sustainable Roads (n=3)

Civil Engineering (n=2)

Lego Team Building (n=2)

Mechanical Engineering (n=2)

Atmospheric Icing Loads in Future Climate (n=1)

Academic Integrity and Civic Responsibility (n=1)

Campus Resources and Support Services (n=1)

Library and Information Literacy (n=1)

National Institute of Standards (n=1)

Slices of Magnetism (n=1)

Spintronics and the Next Generation of Computing Devices (n=1)

Standards (n=1)

When asked to describe key takeaways from the seminars, Scholars variably explain that they gained valuable insight regarding:

- Academic planning and graduate school preparation,
- Substantive topics covered during the session, and/or
- Career planning and employment opportunities.

All Quotes:

Academic Planning & Graduate School Preparation

"Graduate school and the team building were the main seminars that I remember best. The graduate school seminar was by far the most important to me as it's my dream to go to graduate school, but the team building was very entertaining and taught me a lot more about the roles in professional environments."

"The graduate school one really stuck to me and so did the team building. Graduate school taught me steps to get to grad school and team building expanded on the roles in professional environments."

"Most seminars helped me learn about what support can be found on campus and what they can help in. Some related more to engineering and what to expect and what to start to think about for my future timeline. The PE and FE discussions have stuck and thoughts about grad school have stayed with me ever since we had such discussions."

Substantive Knowledge

"These seminars showed how spintronics is changing technology, especially with energy-efficient computing like magnon spintronics. They also highlighted how AI and IoT can make roads safer and cities smarter through better traffic systems and personalized driver alerts."

"Spintronics are a key part of modern technology and they play a crucial role in magnetic sensors. The second seminar topic that stuck to my head was that they introduced a concept to enhance the drivers attention and safety efficiently."

"Both seminars highlighted the importance of adapting engineering practices to address modern challenges. The Personalized Connected Vehicle Messaging System (PCVMS) emphasized how real-time, data-driven solutions -like using VR and IoT to simulate driving behaviors-can enhance road safety by providing personalized alerts for risky behaviors. This idea of using technology to create safer driving environments through tailored feedback really stuck with me as an example of how innovation can directly improve public safety. The second seminar on climate change and structural design illustrated the need to update engineering standards, like the ASCE 7, to account for future weather extremes. The idea that current infrastructure, designed with historical data, may not be resilient to future climate conditions was a powerful reminder of the long-term implications of climate change. These insights reinforced the need for engineers to think ahead and incorporate climate considerations into design to ensure infrastructure resilience. Both talks highlighted the evolving role of technology and climate awareness in shaping the future of engineering."

Career Planning & Options

"From the Civil Engineering seminar I learned a lot about engineering in general and helped me learn a lot about the profession that I want to go into. The Standards Seminar brought in many people from different companies. They talked about what standards were and how there are many standards to make in the industry for all of their careers."

"We learned a lot about the profession of Civil Engineering and how the DOT worked in the first one. In the second seminar about standards and what they were. I don't remember much about the standards one but the engineering one gave a lot of good insight."

Participants were also asked what topics they would like to see covered in future seminars. In response, several Scholars request sessions on career preparation and exploration, while others request seminars covering specific topics relevant to their academic and professional interests, such as mechanical and structural engineering, aviation technology, and AI applications.

All Quotes:

Career Preparation & Exploration

"More things on career and job building."

"Not a new one but maybe more on job and career building?"

"What jobs and more focused on what each field of engineering takes part in [and] a bit more in depth explanations on what courses we will take and what they are about in them."

Other Topics

"1) Innovations in space exploration and their potential benefits on Earth. 2) AI applications in healthcare. 3) Advancements in sustainable aviation technologies like electric or hydrogen-powered planes

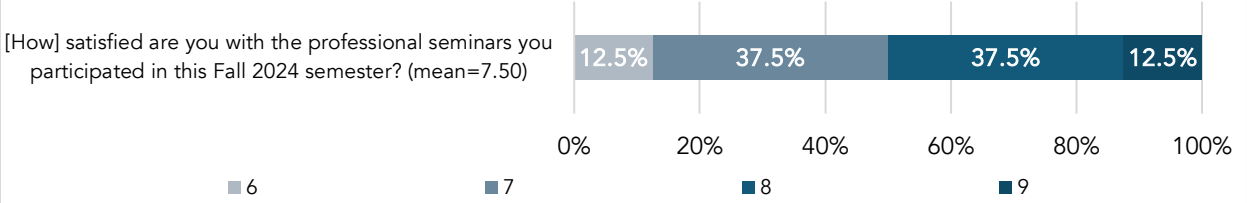
"I would like to hear more about structural engineering when speaking of civil engineering and any issues that may be encountered when doing something in that field."

"I would like to see more about the field of mechanical engineering. All of the seminars on mechanical engineering were during times I couldn't go to so I missed them"

"I would like to see more for Mechanical Engineering and about all the directions Mechanical Engineering can go."

When asked to rate their overall satisfaction with the professional seminars they attended during the Fall semester on a scale from "Not At All Satisfied" (0) to "Extremely Satisfied" (10), respondents provide an average rating of 7.50, indicating a generally positive seminar experience among program Scholars.

Figure 1: Overall Satisfaction with the Professional Seminars (n=8)



Note. This item is measured on an 11-point scale from "Not At All Satisfied" (0) to "Extremely Satisfied" (10); unselected ratings are not shown.

Lastly, Scholars were asked how the professional seminar offerings could be improved. In response, one participant intimates that they were satisfied with their experience and that no improvements are necessary, while two Scholars respectively comment on their seminars' 1) timing/scheduling, 2) planning and organization, and 3) lack of engaging and interactive elements.

All Quotes:

Timing & Scheduling

"Later sessions, too early made me drained and tired."

"Preferably later in the day, we were always drained or tired."

Planning & Organization

"One of the seminars I went to was not very organized but that is the only thing I think could be better."

"Some of the seminars I went to weren't very well put together and were kind of messy."

Engaging & Interactive Elements

"I would say that they should involve more audience engagement."

"These seminars could be improved by including more interactive sessions, such as Q&A panels or hands-on demonstrations."

Other Comments

"I think they were overall good and the attachment of slides was also helpful if I ever needed to refer back to a lesson."

Summary & Reflection

Overall, survey results demonstrate that all responding Scholar met the two-seminar attendance requirement during the Fall 2024 semester and walked way from the sessions with valuable insight regarding graduate school preparation, career pathways, and/or substantive topics relevant to their chosen area of study. Although Scholars tend to describe the offerings as informative and express a moderate to high level of satisfaction with their overall seminar experience, nearly all would like to see a wider range of topics covered during these sessions (e.g., AI, structural/mechanical engineering, career exploration).

To improve the seminars, these Scholars recommend scheduling the events later in the day, more careful planning and organization of the sessions, and incorporating more engaging and interactive elements. At this time, evaluators encourage program leaders to consider these findings and participant-provided recommendations during ongoing seminar development and implementation in order to improve such experiences for current and future S-STEM Scholars.