

Understanding the Impact of SUNY Poly's S-STEM Scholar Initiative

*"Supporting Degree Completion in Engineering and Engineering
Technology Programs through Experiential Learning and Self-
Directed Professional Development."
~Year 1 Key Partner Interviews~*

A Report To:



SUNY POLY

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Inspired Social Research & Program Evaluation

Table of Contents

Introduction	3
Interview Results	4
Satisfaction with the Program	4
Institutional Strengths that Benefit Program Implementation	5
Challenges to Program Implementation & Sustainability.....	6
Program Success.....	7
Key Partner Recommendations	8
Concluding Thoughts	9
Toward the Future.....	9

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 the 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 those who enter as first year students as well as transfer students. Over the program's duration, this project 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 - Retention Track,
- S-STEM Seminar and Workshop series - Identity and Experiential Learning Track,
- 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.

As this is the first year of program implementation and Scholars are yet to be recruited into the program (anticipated for Spring 2024), results focus on key partners (faculty, staff, administrators) knowledge and understanding of program components. Program evaluator Dr. Megan Mullins conducted key partner interviews to collect feedback on the program from nine key individuals at SUNY Poly responsible for decision-making on implementation and sustaining program components. Participants were asked to describe the strengths of the institution in matching this type of program, what they find exciting about the program for SUNY Poly, program impact that will help them determine whether or not the program has been successful, and challenges to program implementation or sustainability that they want both the evaluator and program Principal Investigator to be aware of.

Interviews were conducted over Zoom and lasted approximately 30 minutes. The interviews were transcribed, and the resulting data was coded, categorized, and analyzed for emerging themes. In many cases, multiple themes were present in a single response. The following summary presents primary themes of these interview results.

Interview Results

Satisfaction with the Program

SUNY Poly key partners are excited for the S-STEM program and most report that the initiative will bring together many university strengths into an articulated, cohesive approach to recruiting and retaining students into engineering pathways, whether it be the traditional engineering degree or a degree in engineering technology. Participants expect that the program's ability to offer two tracks to promising engineering students combined with grant-provided financial and academic supports to increase program student retention. When asked what, for them, will be some of the highlights of this initiative being a part of their institution, many underscore the engineering degree options available to students and the emphasis placed on providing a supportive first-year experience.

Select Quotes:

"While they are both engineering, the engineering tech students are a little more hands-on. Having those pathways for students to slide back and forth in year one, which we currently have, but with the S-STEM proposal, helping to provide more opportunities for enabling the students to realize really what it is that they are doing in engineering and engineering tech from a broader perspective. They don't always know what an engineer does, and then they walk in the door and, 'Gosh, that is hard' and 'I'm not sure I can do this.' Having that support to enable them to see what they could be in four years. That is exciting about the whole proposal."

"Just having more student support, student assistance, advising that is all just going to be beneficial to the students. So that's the end goal here is just helping our students."

"I do see it as a large benefit to the campus community if it really will help to create a unique scholarship for students who would not necessarily be in a higher education standpoint without this scholarship."

"Everything at SUNY Poly is individualized and personalized. A student being able to participate in the S-STEM scholarship and receive the one-on-one, mentorship, the financial support, all of the components that are encapsulated through the grant, I can just see it being an incredible opportunity to relaunch our retention of first year students. It [retention] is abysmal right now."

"This program is really critical for us to overcome some of those barriers down the long haul. Another is this program puts a lot of emphasis on both the [first] year science and math courses. That is how important that first year is, especially in the engineering program for retention purposes. ... The third part is the effort they put on low income or, in general, underrepresented groups of students that can increase our diversity background population in the engineering program."

"The engineering licensure or having accessibility to it because some of the review courses can be quite expensive once you get out into the world, so we offer it here. Just encouraging them to take the exam, giving them every opportunity to prepare for and take this exam are a lot of the things that are key parts for me with respect to that test."

Institutional Strengths that Benefit Program Implementation

When asked what institutional strengths participants see SUNY Poly providing the initiative, several participants reiterate the unique combination of engineering pathways offered at the university. Additionally, partners highlight the small size of the campus facilitating a personalized academic experience, faculty members who have demonstrated a commitment to student engagement and success, and supportive administrators and industry partners.

Select Quotes:

Engineering Pathways

"We are one of probably five or six campuses in the nation with this slate of engineering and engineering tech. That just really makes us unique. And we are a public institution, so that also makes us more affordable. Again, having those multiple pathways for students to get that training and be either an engineer or engineering tech in a way that enhances their retention, which is just exciting for us at SUNY Poly. We have a really strong backbone of industry support and that is just been continuing to build and build. With our most recent announcement from the governor of a 44 million investment into our campus, 18 of which is going to be going to the College of Engineering and highly impacting engineering and engineering tech students – it is exciting times for SUNY Poly. This S-STEM grant is going to really serve us well and we are providing that framework to help it succeed as well."

"We have both programs, which is rare actually in the U.S. right now for a lot of the engineering colleges, I don't know how many, but probably a handful of colleges still have the two programs in the same institution. We think that is very unique. It gives our students a lot of opportunities."

"I just think our institution is really unique. We're the only public polytechnic offering engineering and engineering technology. We also have other great STEM programs like biology, which is doing phenomenal here. So it's a nice fit."

Faculty Commitment to Student Success

"Here at SUNY Poly, we are a small campus community. We have 2,200 undergraduates, which means that each one of our students, regardless of starting with us as a first year or transitioning into our programs, you are taken care of as a real person. And that is something that I felt firsthand as a student during my time as a SUNY Poly student. Our institution really has that infrastructure already in place to support students and this would only benefit students further to give them a little bit more support."

"It is a good fit for us because we need those programs to help bolster our retention. That, first and foremost, for me is a huge piece for us. Secondly, the people here who are taking the lead in implementing have a proven track record of student engagements. Again, because we are small, when our faculty are hired here, they know that they are going to be doing academic advising. ... that one-on-one personalized attention that we already give to students just makes us a great fit for the grant as well."

"Our upper administration is very supportive of the program because we are really trying to identify how we can improve the retention rate for our students and how we can improve our students' science and math skills in their first one to two years. ... The grant here is really a great opportunity for us to collect a lot of data on those aspects to help us identify what works, what doesn't, and we can dedicate future resource and develop some strategy that, after the grant is gone, we can still sustain."

Challenges to Program Implementation & Sustainability

Participants were next asked to identify concerns that the PI will need to consider when planning for implementation or program sustainability. For these partners, the greatest challenge emphasizes sustainability over implementation challenges. More specifically, partners emphasize that a key to the program's sustainability will be securing the staffing and funding required to maintain current scholarships and programming beyond the life of the grant. Additionally, partners report on the importance of ensuring that personnel remain engaged and on track to meet program goals throughout the grant period. They recommend that clear communication of program benefits to both prospective students and across departments is critical to moving the program forward to sustainability. Notably, one partner highlights the need to garner initial buy-in from local industry partners and to maintain ongoing, mutually beneficial partnerships.

Select Quotes:

Personnel & Funding

"I do think one of the challenges would be the human capital to run the program and knowing that we have systems already put in place that could automate some of the experience in terms of the administration. I just know how deeply involved [name] is in multiple facets of campus. We just adore her. ... There is no better way to say it. I love how much she cares for our students. Without a doubt, I know that she is the best person to be the PI on this grant, but I also know how much she has on her plate and I just don't want her to feel overwhelmed or overworked when we can automate some of those pieces because it does seem right now that a lot of it is a manual process."

"Sometimes with these five-year programs, and probably it is not going to happen in this case because it has got clear year 1, 2, 3, 4 goals. Don't lose sight of your deadlines [and] program management and people management. She [PI] has a good team, but they have all got to be corralled to make sure that they are all meeting their goals, whether it is the summer program or the folks in the admissions office or the faculty programs that she has. They have all got to be invested and stay invested. That is always a challenge with program management. ... And then long-term sustainability, what is our next funding source to help grow this program? If we find out what the magic sauce is that works, and try to be actively looking for that, starting to look at that even in year two or three, because you can't start that development side of the sustainability equation early enough."

"I find that keeping momentum for things going, not necessarily with this program, but in general. I know it is sometimes challenging because we get comfortable and we get distracted with other things. Keeping those metrics, graduation rates, or retention rates or whatever it is across your spectrum, sending out reports to faculty quarterly, semi-annually, whatever makes sense, is a good way to hold yourself accountable. ... It will help everybody understand that the program is on track or maybe isn't on track."

"The biggest one is funding... really makes a large difference in students who are in financial issues of lower socioeconomic status. That comes into play when students are deciding on colleges- who gives me the biggest scholarship? Where can I get the most financial aid? How can I assure that the degree that I'm getting is going to pay off in the long run? ...I know that sounds sort of standard for everything, whether you are looking to begin a new program or funding a grant, money really does come down to how well a program can succeed."

"The only challenge I see is staffing [and] changes in staffing. There has been a lot of turnover since COVID."

Communication of the Program to Students & Departments

"One of the major challenges would probably be recruitment. I have seen a lot of students that come from an academically or financially disadvantaged environment, they don't feel that they can achieve these more difficult-type programs. ... One of the biggest hurdles in my experience with this would be providing students with the knowledge that they know they will succeed in this program because of the support that we will be able to provide for them. And that is not to say that they wouldn't be able to succeed without the support, but providing that will just be better for them in their time in higher education."

"At this moment I would be guessing the interdepartmental collaboration they require to have all the information they need at this moment to move on or forward with the project. Currently, at least from my knowledge, I know a lot of our departments, like Finance, Admissions, HR, even I.T., they are all short."

Industry Partnerships

"What I'm hoping to do, and I think the S-STEM might help us get there. What are the opportunities for industry to participate day one, whether it is mentoring or developing hands-on projects for the first-year courses in labs? Just have them really buy into having multiple touches every year for every year of a student's career. They are all desperate for employees. They are feeling this crunch of demographics. There are not enough students, and they are seeing it coming with all of their retirees. The bucket filling those spots is smaller. The industry is actively looking for ways to participate more with campuses because they need employees and they are all going to be fighting for a smaller bucket of students. If they are only looking for traditional students, it is rather limiting. And it is limiting for us too. We are also looking at non-traditional students and how can we get more non-traditional students into our academics? Whether it is for stackable micro-credentials that eventually lead to a four-year degree or maybe it is just a few certificates that gets them in the door and working at one of our local companies."

Program Success

When asked to identify how they define program success, respondents emphasize the importance of seeing Scholars successfully complete their program and move on to pursue graduate school opportunities or secure post-graduation employment. Additionally, partners would like to see best practices in increasing retention and diversifying the student body sustained at SUNY Poly after the grant has ended.

Select Quotes:

Student Retention & Graduation

"The programs have a broader impact because we will have these types of events that the majority of the students will partake in. A bump in retention would be great. And also, can we find any correlation with respect to our demographics? Because I think they had some details in there with how the S-STEM might impact demographics, whether it is underrepresented minorities and/or lumped into that nowadays, first in their family to go to college."

"The first one is our retention rate in the engineering program. I know the grant is more on mechanical and engineer technology, it still gives us the data we want to look at in the future about how we can improve the retention rate, especially in the first two years. I want to see what strategy, based on the strategy that the grant is using, I want to see the improved student skills in math and science in their first two years. That is somehow tied to the retention already. If they are successful in those, we probably automatically have a higher retention rate. Also, the graduation rate, and the four-year graduation rate down the road, bringing in the transfer students as well, to see if they have a successful graduation and a successful career down the road. The final one I want to see as successful is whether we can increase or diversify the student population in our engineer program."

"To get them obviously in the door of Poly. But for the program itself, not only for them to succeed in higher education, but then come out with a career that they love, come out with internship opportunities that they have already explored, into connections that they have already made. The ability to interview and to have those skills that you don't necessarily learn in a classroom, but that they will have access to here at Poly."

"For some of them [students] it is that they feel like college isn't for them. I can get that feeling from talking with some of them and I try to help them along as I can from where I sit, not being an advisor. I only see them in one context, but I would like to see more hang around. ...Helping them to stay on board because I see that they can do it, would be an important way to measure things."

Sustainable Pathways & Supports

"I started working with this program before I was even a student at SUNY Poly. I benefited from this program and now I want to be an ambassador for all of the really great things that it does. Bring them on the road with us or have them facilitate a webinar. Identifying a strategic funnel for students to remain involved and then creating sustainable pathways for that to continue to happen after people have left their roles."

"Creating those sustainable mechanisms to make it happen. Seeing that strategic funnel of involvement from participant to mentor and ambassador, creating sustainable pathways for that to happen, [and] continue to happen beyond the people who are already established and planting for the program to exist. Third, we will see increased retention in those students. And fourth, I hope that we will see increased four-year graduation rates for that particular cohort of students. Fifth, I would love to see those students with consistently higher GPA than their non-S STEM cohort students. That is a really great indicator of the support that they are receiving."

Key Partner Recommendations

In their recommendations for what program leadership needs to consider in order to sustain the program past grant funding, key partners primarily highlight the importance of cross-departmental communication and collaboration, including sharing best practices to facilitate student success and sense of belonging, awareness of available students resources and supports, and documentation of program protocols and processes to retain institutional memory in the face of staff turnover.

Select Quotes:

"We have a lot of folks here, specifically in the student affairs area, who would love an opportunity to be tapped to be involved in a program like this. Creating funnels for training those folks and onboarding them to the process just gives you a little bit of grace if someone or multiple people are to be leaving around the same time. How can we create lasting documents that someone could pick up where we left off and know what to do."

"Funding is there for things that I'm not even aware of. For example, in the last couple of weeks, I learned about money being available for students who need smaller things... calculators, books or school supplies. The university does apply that. ...There is an awareness gap for some things for students who need some help, more so than the fact that it's not available."

"How we could integrate some of the solutions into our classes as well. I'm learning more [about] how these factors can influence a student's success. What are some thoughts on how to work it into what we do from our side of the podium, so to speak. Happy to do so, I don't always think about them."

"Working collaboratively as an entire team will be the best way to benefit [the students]. Working with the recruiting piece of it, working with the academic advisors that we have already currently staffed with our first-year students, working with professors to ensure that when these students start in these civil engineering or mechanical engineering programs, that they are highlighted in a discreet manner by all means, to ensure that these students aren't falling behind, by the wayside. My biggest recommendation would be to make it a full campus collaborative environment and components."

Concluding Thoughts

Lastly, key partners were given a chance to share any other comments or thoughts they had about the program, with several participants using this opportunity to express their appreciation for the initiative and the opportunities it will provide students.

Select Quotes:

"This is a great initiative. I would love to assist in any way possible. Obviously, this will be a big undertaking, much like our other opportunity programs that we have on campus. Providing further opportunities for students is the best way to ensure that everyone who would like to has access to higher education."

"I really appreciate them for this initiative. It is going to benefit our institution a lot in the long haul. We are trying to be a premium polytechnic institution in New York State and the nation. That is the goal."

Toward the Future

Interview results demonstrate that key partners are excited for SUNY Poly's newly funded S-STEM initiative and are committed to supporting implementation efforts. Participants expect the grant to boost student retention, completion, and job placement, and hope to see best practices in promoting student success and belonging developed and disseminated as a result of the initiative. Partners see the university's multiple engineering pathways, committed faculty and administrators, and small, personalized learning environment as institutional strengths that

will support program success. However, participants highlight several major challenges to program implementation and sustainability, including staff turnover and securing ongoing funding, maintaining mutually beneficial industry partnerships, and clearly communicating program benefits to both prospective students and collaborating departments and offices on campus. At this early stage of the grant period, partners emphasize the importance of cross-departmental communication and collaboration and recommend that program organizers endeavor to develop and share resources detailing best practices in the classroom and available student supports, as well as documentation that outlines program protocols and processes to retain institutional memory during leadership and staff turnover.

Consideration of the findings presented in this report during the next stages of grant-supported programming can help program organizers both leverage the unique strengths of SUNY Poly and anticipate the challenges to program implementation and sustainability identified by key stakeholders.