

LEADERSHIP DEVELOPMENT PROGRAM PATHWAYS TO STEM EXCELLENCE

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ABSTRACT

The NSF STEM project at Southern Illinois University Carbondale in Carbondale, Illinois, called Pathways to STEM Leadership (PSL), provides scholarships for talented, low-income students with demonstrated financial need who are pursuing STEM degrees. The PSL program seeks to improve the recruitment, retention, graduation rates, and job placement of community college students transferring to Southern Illinois University Carbondale STEM colleges. The program is designed to help STEM students become future leaders in industry by providing them with leadership training, mentoring, a cohort experience, and community service opportunities. Development of technical leaders has become a critical need for the United States in helping to maintain a competitive position in a technology-based global economy. Scholarships and support for low-income and academically talented students, who may not otherwise be able to obtain STEM degrees, will help to produce a well-trained workforce that will contribute to the economic well-being of the nation.

The Leadership Development Program's (LDP) Pathways to STEM Leadership (PSL) scholarship program has demonstrated value through effectively recruiting scholarship students, providing opportunities to become confident through leadership activities, and with students exemplifying these leadership activities in the LDP and in other registered student organizations (RSOs) at SIU Carbondale.

Further, the students and the program coaches have very high ratings for program quality. The program evaluation was able to identify how the LDP has an impact on students beyond their experiences at the University, but the evaluation data gathering effort was not sufficient to capture how the program affects institutional, corporate or community transformation.

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INTRODUCTION

The LDP has demonstrated the ability to build a professional STEM workforce for tomorrow. For the past ten years, the LDP has achieved a more than 96% graduate placement record, significant increases in timely graduation, and increased corporate sponsorship for the program and its graduates. Therefore, the NSF funded Pathways to STEM Excellence (PSL) program is built on the LDP success.



STUDENT PROGRAM SUCCESS

Broadly, 46 students have been involved since fall 2017 in the LDP program (including scholarship and non-scholarship students). Four students received a scholarship during the 2017-2018 academic year, 10 more were added during the 2018-2019 academic year, and an additional 9 are scheduled to start in Fall 2019. Among the scholarship students, three have graduated and the other 11 are still enrolled as students and are still involved with the LDP program. There is one scholarship student who enrolled in Fall 2017 who has not yet graduated and will remain involved with the program for the 2019-2020 academic year.

Metric	PSL Scholars	SIU Comparison
Recruitment: STEM majors will be recruited in to the PSL program as transfers from community colleges who are first-generation, academically talented and economically-disadvantaged.	14	NA
Retention: PSL Students will be retained as undergraduates at a rate of 25 percent higher than non PSL students	100%	87%
Graduation: PSL Student will graduate at a rate of 25 percent higher than non PSL students	100%	65%

RESULTS

Evaluation Question	Answer and support
1. Did the PSL program recruit, retain, and graduate students?	Yes. 14 scholarships have been awarded, students have been retained and are graduating on time.
2. Have the participants increased their knowledge on leadership training and its potential?	Yes. Students demonstrated significant growth on the Self-Efficacy scale and, in comparison to a control group. The scholarship students also demonstrated significant growth on the Motivation to Lead scale and, in comparison to a control group.
3. Have the participants demonstrated leadership through student program involvement?	Yes. All reported on the survey that they have been involved with a senior leadership role with a registered student organization (RSO) outside of the LDP.
4. Did the student, faculty, and community participants perceive the PSL program to be valuable?	Yes. In aggregate, 95% of the students and 100% of the Coaches agreed with the items on the survey concerning program quality.
5. Did the PSL program demonstrate sustained impact on institutional, corporate, or community transformation?	Yes, but only for students beyond the program. Further evaluation work is needed to study this sustained impact through involvement with programs that occur with business leaders at corporate locations and whether the program can be further expanded at SIU Carbondale or at other institutions.

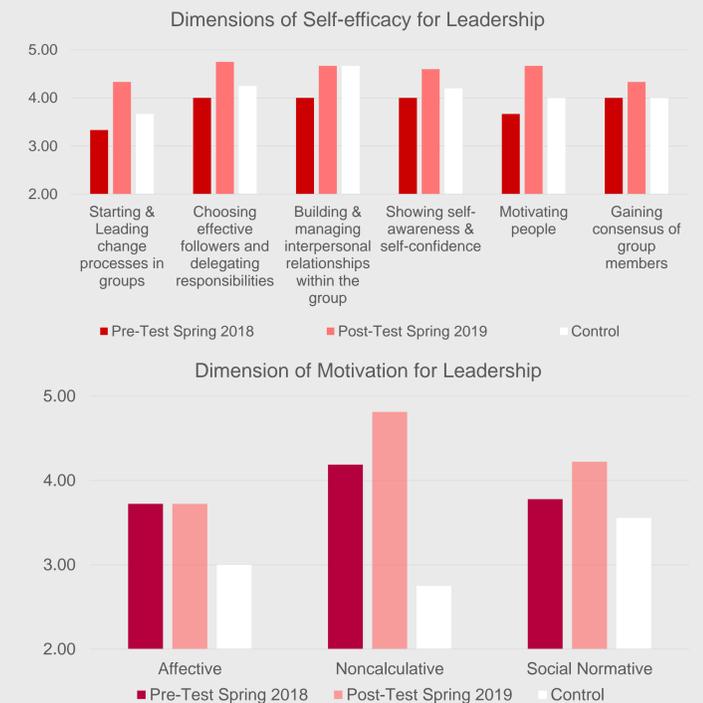


PROGRAM QUALITY

To what extent do you agree with the following statements?	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
This program has met my expectations.	0%	0%	7%	11%	81%
If given the choice, I would do this all over again.	4%	0%	4%	22%	70%
I would recommend this program to other students.	0%	0%	4%	11%	85%
This program met the objective to prepare me to be a leader in the STEM workforce after I leave school.	0%	0%	0%	26%	74%

LEADERSHIP KNOWLEDGE

Overall, LDP scholarship students demonstrated significantly higher Leadership Self-efficacy in comparison to their own pre-survey scores and, in comparison to control group findings. They also demonstrated significant growth on the Motivation to Lead survey in comparison to their own pre-survey and, in comparison to the control group.



LEADERSHIP EXAMPLE

Of the 27 students interviewed, eight were second year students. All (100%) of the second year students responded they have taken a senior leadership role in an organization outside of the LDP. Further, all the 2nd year student mentioned their leadership role in a Registered Student Organization (RSO) during the focus group. First year students also responded with active or planned engagement with senior leadership roles.

SUSTAINED IMPACT

From the focus group with the second-year students, at least ten instances of carry-over of student leadership skills to other organizations outside LDP were identified. Of those nine instances, five involved LDP students using skills in corporate settings, four involved other organizations within SIUC and one in the local community.