Translating Learnings From STEM Scholarship Winners Into Effective Strategies For Fostering Student Success

Pre-Conference VII

Maria Luz Espino
Michelle Van Noy
Will Tyson
Debra Bragg

COMMUNITY COLLEGE
S-STEM NETWORK

Presenters

Michelle Van Noy (PI), Rutgers, Education and Employment Research Center

Will Tyson (Co-PI), University of South Florida

Maria Luz Espino (Co-PI), Rutgers, Education and Employment Research Center

Debra Bragg (Key Personnel), Bragg and Associates

COMMUNITY COLLEGE S-STEM NETWORK

The Community College S-STEM Network (CCSN)

The Community College S-STEM Network (CCSN) is a new 5-year National Science Foundation (NSF) S-STEM Research Hub dedicated to generating and sharing research to promote the academic and professional success of scholastically-talented, low-income community college (CC) students majoring in science, technology, engineering and mathematics (STEM) disciplines.

Primary Objectives

To establish and engage with a network of individuals and institutions to frame current issues associated with the education of low-income STEM majors in CCs and identify specific areas of research focus;

To undertake research on CC S-STEM programs to produce evidence and instruments to be shared with practitioners and researchers

To increase educational and social science research capacity within CC personnel, especially STEM faculty members.

Today's Agenda

- Engage participants in translating insights from S-STEM scholarship community college students into actionable strategies.
- Use case studies and collaborative discussions to develop personalized roadmaps.
- Focus on enhancing initiatives to improve retention and success for diverse STEM student populations.
- Support STEM students in community colleges through tailored approaches and strategies.

COMMUNITY COLLEGE S-STEM NETWORK

COMMUNITY
COLLEGE
S-STEM
NETWORK

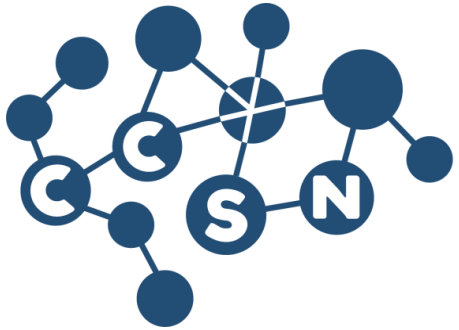
University of South Florida

Introduction

Study Focus: Impact of NSF Scholarships in STEM (S-STEM) program on community college transfer students pursuing engineering degrees at a four-year university

TURNPIKE Project - Transfer Undergraduate Rural/Nontraditional Student Pathways through Identity, Knowledge & Engagement

- Partnership between Polk State College (PSC) and University of South Florida (USF) Engineering
- Supports rural, non-traditional, and underrepresented minority (URM) students



COMMUNITY
COLLEGE
S-STEM
NETWORK

Purpose

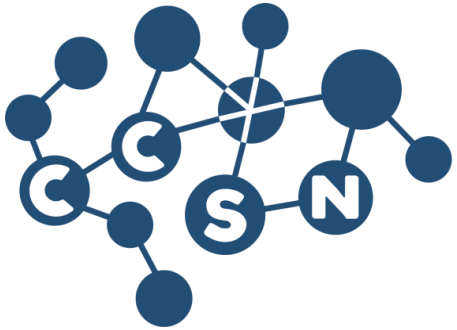
Purpose: Explore how community college transfers utilize scholarship toward overcoming financial, academic, and social challenges they believe would otherwise stunt their progress toward an engineering bachelor's degree.

Core Research Questions:

- How do S-STEM scholarships allow low-income community college transfer engineering students to prepare for success at a four-year university?
- How do S-STEM scholarships contribute to the work-life-school balance of low-income community college transfer engineering students?

Qualitative Methods: 23 in-depth interviews and four focus groups with 16 total students

Data Collection: Investigated personal and educational backgrounds, decisions to major in engineering, transition from community college to USF, and effects of the S-STEM scholarship



COMMUNITY
COLLEGE
S-STEM
NETWORK

HOW COMMUNITY COLLEGE TRANSFER S-STEM SCHOLARS IN ENGINEERING SPEND SCHOLARSHIP FUNDS TO ENHANCE THEIR ACADEMIC SUCCESS

Optimizing Work-School-Life Balance: Students reduce their hours from full-time to part-time or from part-time to not working at all which allows them more time to study.

Financial Safety Net: Students put money away for savings, utilities, essentials, bills, and to cover unexpected expenses. Students use funds as a backup for financial aid.

Reducing Commuting Costs: Students pay for gas and car repairs and/or reduce their commute by moving on-campus or near campus.

Family Medical and Financial Emergencies: Bring family stability during difficult circumstances.

COMMUNITY
COLLEGE
S-STEM
NETWORK

HOW S-STEM SCHOLARSHIPS FACTOR INTO STUDENT DECISION-MAKING IN STEM DEGREES AND CAREERS

Academic Choices and Support: Students make more informed academic choices and form study groups, overall reducing self-doubt and uncertainty.

Community and Social Engagement: Students broadened their networks and increased involvement in community activities.

Motivation and Persistence: Camaradarie and encouragement from peers to overcome doubts and stay on track.

Career Opportunities: Information and internships and potential career paths.

COMMUNITY
COLLEGE
S-STEM
NETWORK

A COMPENSATED COMMUNITY MODEL FOR FOSTERING BELONGING IN COMMUNITY COLLEGE TRANSFER STUDENTS

Advising: Intrusive advising system with frequent check-ins facilitated stronger advising relationships and tailored advice. Advisors provided professional and emotional support.

Tutoring: The program encourages students to participate in tutoring sessions and aids in the formation of academic support networks. This reduces social isolation and improved collaboration.

Bi-weekly Meetings: Student group meetings for community building centered on professional development and personal growth in a non-competitive, collaborative environment.

COMMUNITY
COLLEGE
S-STEM
NETWORK

COMMUNITY
COLLEGE
S-STEM
NETWORK

Everett Community College

Everett Community College Case Study

"Students who begin their [postsecondary]education at community colleges often encounter financial and structural barriers that hinder their ability to complete STEM programs and achieve their academic and career goals" (e.g., Bahr et al., 2017; Wang et al., 2020).

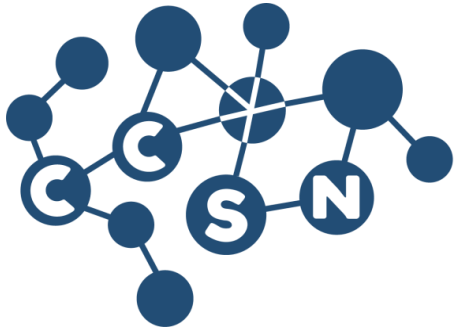
Focusing on the Everett Community College (EvCC) S-STEM Scholar program, this case study explored how academic and social supports factor into student decisions to persist, complete an associates degree, and transfer in a STEM pathway.

****Retention of Academically Talented STEM Scholarship Recipients in Community College, Elizabeth Meza, Maria Espino, & Debra Bragg (under review)*

COMMUNITY
COLLEGE
S-STEM
NETWORK

Research Questions

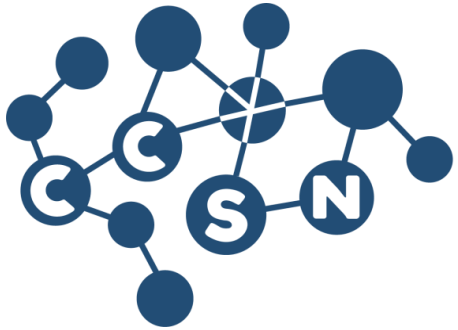
- How do EvCC students engage with and perceive of the academic and social supports embedded in the EvCC S-STEM Scholar program?
- What aspects of the S-STEM Scholar program do participants find most influential in shaping their academic and career decisions?



COMMUNITY
COLLEGE
S-STEM
NETWORK

EvCC's Track II S-STEM Grant

- Aims to enhance financial, academic, and social (co-curricular) aspects of the STEM pathway
- Emphasizes inclusion of women and racially minoritized groups who face barriers to pursuing and persisting in STEM without financial assistance
- Makes curricular [e.g., Academic Excellence Workshops (AEWs] and co-curricular changes (e.g., faculty mentoring, peer communities) to increase student access to and retention in STEM to prepare graduates for high-wage employment



COMMUNITY
COLLEGE
S-STEM
NETWORK

Framing & Findings

Sense of Belonging

- Students felt connected to the CC STEM community
- Engagement in STEM activities helped student confidence in academic pursuits grow
- Engagement in professional opportunities on and off campus reassured students that STEM education and careers would be a good option them

Student Academic & Career Decisions

Science/Engineering Identity

- Students reported STEM-specific advising influenced their choices of STEM majors
- "Warmed up" aspirations shifted some students from technical to transfer pathways
- The S-STEM scholar program catalyzed student self-identification as legitimate members of the STEM community.

COMMUNITY COLLEGE S-STEM NETWORK

Implications

- Comprehensive supports (faculty mentoring, peer communications, and scholarship and financial aid), even if partially implemented, work together to shape student decisions and outcomes: retention, degree completion, intent to transfer
- S-STEM scholars who are recognized as legitimate members of the STEM community report enhanced persistence and academic success
- STEM-specific advising plays a critical role in student decisions to pursue STEM majors, including commitment to transfer to university STEM pathways

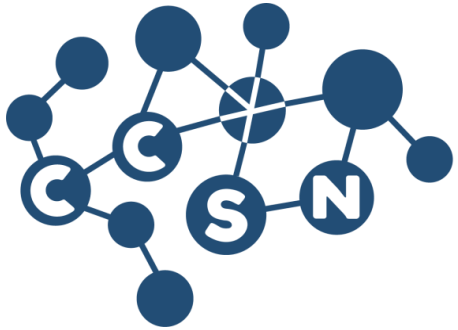
COMMUNITY
COLLEGE
S-STEM
NETWORK

COMMUNITY
COLLEGE
S-STEM
NETWORK

Holyoke Community College

Background

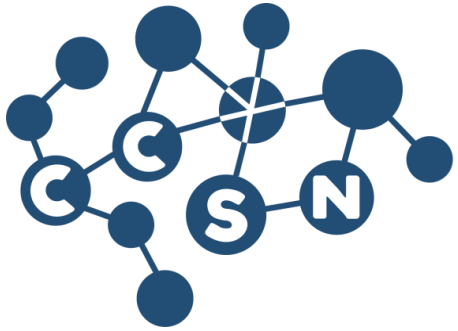
- Community Colleges serve as a critical gateway to higher education, especially for students who are financially disadvantaged or come from marginalized backgrounds (Funk & Parker, 2018).
- CCs are essential in broadening access to academic opportunities in STEM by offering open enrollment policies, affordable tuition, and diverse support services (Rodriguez et al., 2019).



COMMUNITY
COLLEGE
S-STEM
NETWORK

Research Questions & Framing

- How do specific components of HCC S-STEM Scholars Seminar impact students decisions to persist in a STEM Pathway?
- In what ways does the integration of culturally relevant pedagogy (CRP) and community cultural wealth (CCW) into the STEM seminar influence the students' decision-making?



COMMUNITY
COLLEGE
S-STEM
NETWORK

Holyoke Community College Context

HCC STEM Scholars 2.0:

- Five-year 1 million grant from NSF S-STEM

Goals:

- Foster a sense of belonging and academic success through mentoring, research, community service, internships, and honors experiences

COMMUNITY
COLLEGE
S-STEM
NETWORK

S-STEM Scholars Seminar

- 1 Credit Course
- Designed for STEM Scholars Cohort to provides a weekly seminar based introduction to the STEM disciplines and careers
- Guest Lectures, Technical assistance, academic success, workshops faculty/peer mentoring, and scholar presentations.

COMMUNITY
COLLEGE
S-STEM
NETWORK

Findings

- Impact of STEM Seminar on Student Persistence
  - **Mentorship and Peer Support**
  - **Academic Resources and Tailored Support**
  - **Sense of Belonging and Community**
- Influence of Culturally Relevant Pedagogy (CRP) and Community Cultural Wealth (CCW) on Decision-Making.
  - **Cultural Affirmation and Empowerment**
  - **Building Confidence and Resilience**
  - **Critical Reflection on Educational and Career Pathways**

COMMUNITY
COLLEGE
S-STEM
NETWORK

Implications

- **Prioritize Inclusivity in STEM Program Design**
- **Support Faculty Professional Development**
- **Enhance Support Beyond the Classroom**
- **Foster Strong Mentorship and Peer Support Networks**
- **Personalize Academic Support for Students**
- **Connect STEM to Broader Social and Cultural Issues**
- **Ensure Community-Based Support Systems**

COMMUNITY
COLLEGE
S-STEM
NETWORK

COMMUNITY
COLLEGE
S-STEM
NETWORK

Discussion & Activity

Small Groups

- What unique approach highlighted in the case studies could be adapted to your institution's context?
- How can your institution better support underrepresented STEM students, particularly in terms of academic, social and financial support?
- What institutional barriers need to be addressed to improve STEM student retention?
- How can faculty and administrators collaborate more effectively to support S-STEM students?

COMMUNITY
COLLEGE
S-STEM
NETWORK

Strategy Mapping

- **Strategy**: What is the key strategy identified?
- **Resources Needed**: What resources (staff, time, funding) are necessary for implementation?
- **Challenges and Barriers**: What challenges might arise when implementing this strategy, and how could they be addressed?
- **Expected Outcomes**: What specific outcomes (e.g., improved retention, higher transfer rates) do you anticipate from this strategy?

COMMUNITY
COLLEGE
S-STEM
NETWORK

Research To Practice Clinics

Join Our Network:

Scan this QR code

COMMUNITY COLLEGE S-STEM NETWORK

Join the Community College S-STEM (CCSN) Network's *Research-to-Practice Clinics*!

Support for low-income STEM majors as they navigate the educational pathways can be a complicated endeavor, these clinics draw on lessons from case studies, surveys, and other research activities to share strategies that promote student engagement and foster successful navigations of STEM pathways.

Michelle Van Noy, Director, Education & Employment Research Center, Rutgers University
Co-moderator

John Krupczak, Professor of Engineering, Hope College, **Moderator** (joined by other community college leaders) He was a Program Officer at the National Science Foundation Division of Undergraduate Education and was a co-Lead of the NSF S-STEM Program.

A Compensated Community Model for Fostering Belonging in Community College Transfer Students

Will Tyson, Ph.D.
Associate Professor of Sociology at the University of South Florida Tampa
April 28, 2 pm EDT

The Case of Corequisite Remediation: Evidence From Higher Education Research

Dan Douglas, Ph.D.
Assistant Professor of Sociology at Montclair State University.
May 20, 2 pm EDT

Creating a sense of belonging for STEM success: Cohorts and other strategies

Elizabeth Meza, Ph.D.
Senior Research Scientist at The University of Washington Evans School of Public Policy & Governance
June 18, 1 pm EDT

Mentoring: Helping to Navigate Complex Pathways Toward Higher Education and Work

Maria L. Espino, Ph.D.
Education & Employment Research Center - Rutgers University
July 22, 1 pm EDT

STEM Pathways and Decision Making: Insight from the Research Literature

Debra D. Bragg, Ph.D.
Professor Emerita, University of Illinois at Urbana-Champaign
August, date TBD

Career Preparation Strategies in STEM Fields
Education & Employment Research Center - Rutgers University
September, date TBD

Each clinic is conducted by an experienced researcher. Content emphasizes results of relevance to practitioners. Each clinic will include opportunities for participants to raise questions and discuss ideas about their own experiences and institutional environments.

Register: https://go.rutgers.edu/clinics

Research Fellowships

Apply Here

Today!

Michelle Van Noy (PI), Rutgers, Education and Employment Research Center

Maria Luz Espino (Co-PI), Rutgers, Education and Employment Research Center

Will Tyson (Co-PI), University of South Florida

Debra Bragg (Key Personnel), Bragg and Associates

Thank you!

www.ccsstemnetwork.org/

COMMUNITY COLLEGE S-STEM NETWORK