UNIVERSITY of WASHINGTON

A Systematic Review of S-STEM programs and Community College Students in STEM Decision-Making

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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.

Purpose

- Community College S-STEM Network (CCSN) work examines:
  - *students' decision making in STEM pathways,*
  - *elements of the S-STEM programs,*
  - *the institutions themselves, and*
  - *students' attributes influence these decisions*.

Background

S-STEM Mission

Community College Students

Literature on students in S-STEM programs

Research Questions

What do we know about the S-STEM programs and programming in community colleges through peer-reviewed, published research?

What notable themes emerge in research related to S-STEM programs in community college?

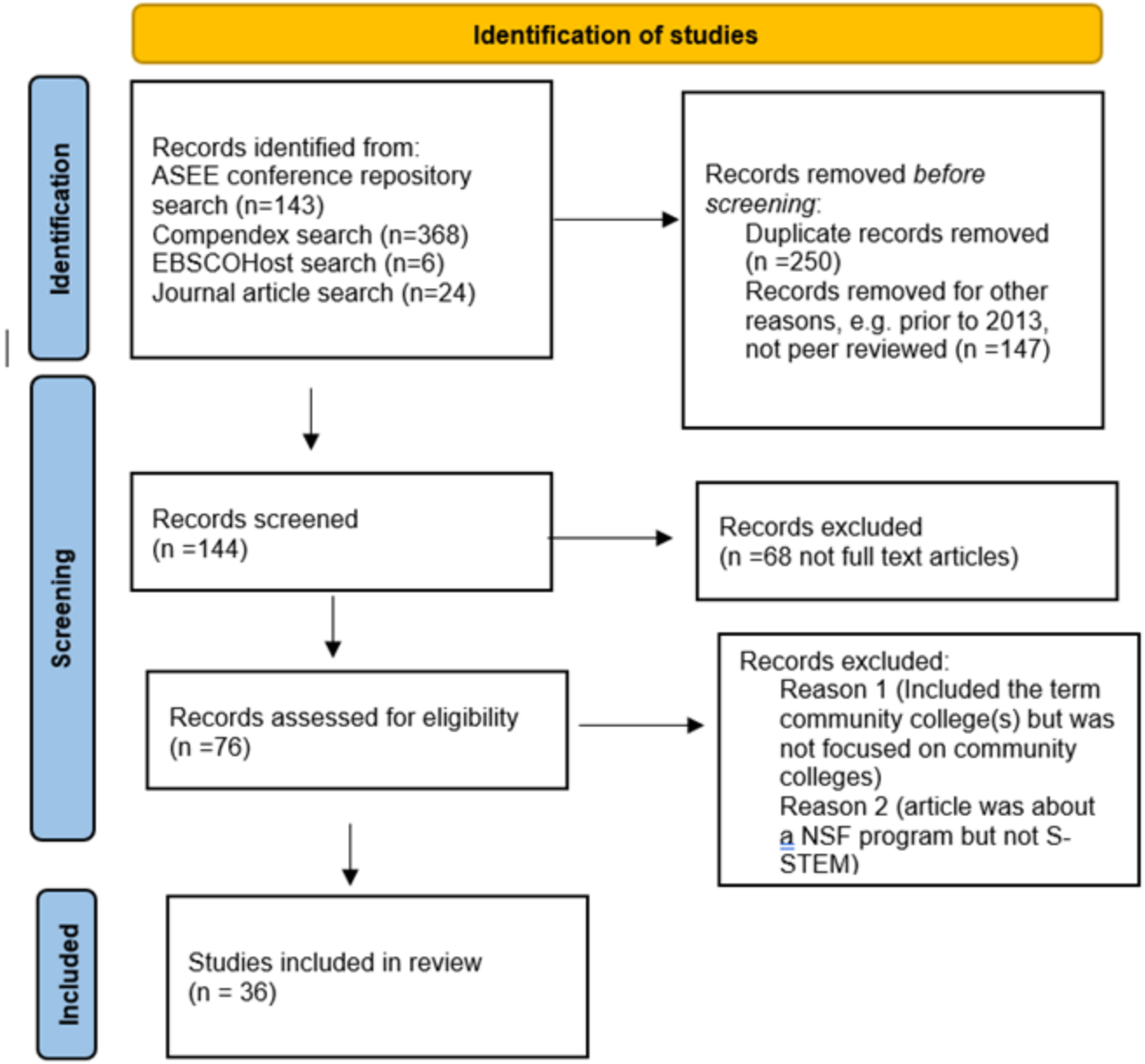
When examining the many different S-STEM program interventions that exist in the community college S-STEM programs, what can we say about how S-STEM influences students outcomes? What are their gaps in the research?

Methodology

- *Systematic literature review*
  - **Databases**
    - Compendex
    - EBSCHost
    - PsychINFO
    - ASEE Peer repository
    - Community college Journals

Inclusion Criteria

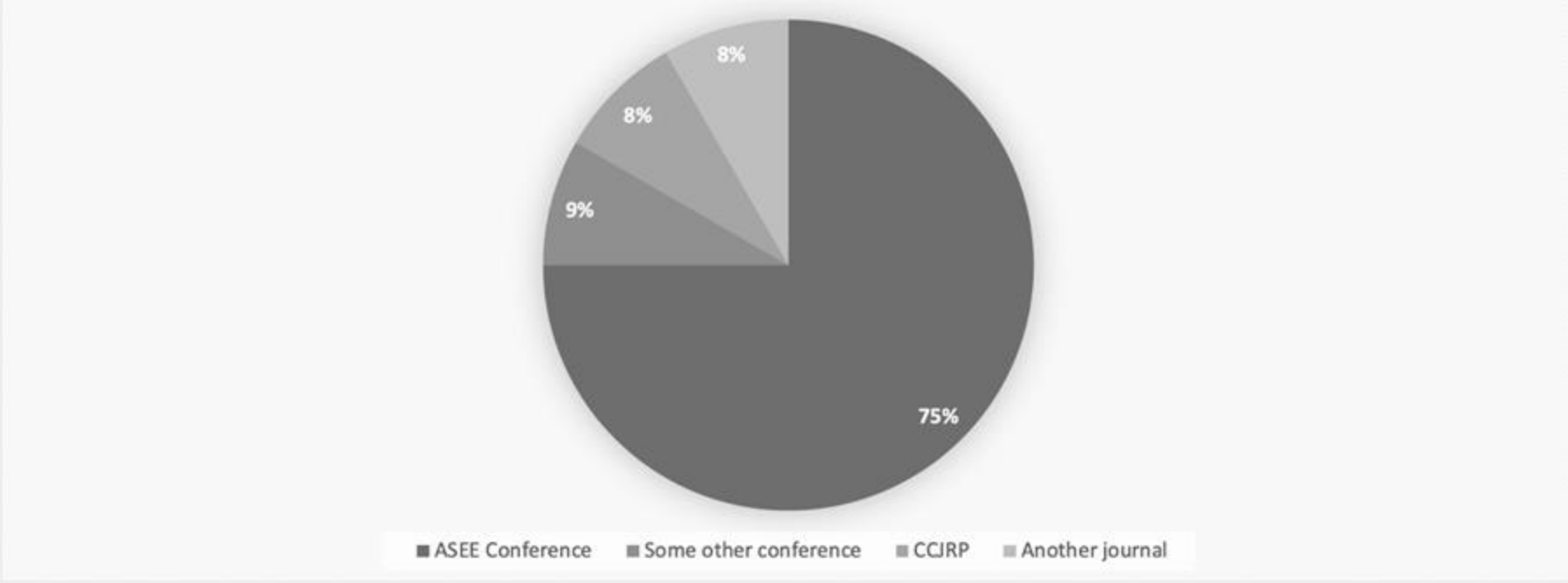
- *Inclusion*
  - *Published between 2013-2023*
  - *Peer-reviewed*
  - *Published article, book chapter, or conference proceeding*
  - *Full-text, written in English*
  - *Awarded S-STEM program in a community college or involving a community college*


Identification of studies
Identification
Records identified from:
ASEE conference repository search (n=143)
Compendex search (n=368)
EBSCOHost search (n=6)
Journal article search (n=24)
Records removed *before screening*:
Duplicate records removed (n =250)
Records removed for other reasons, e.g. prior to 2013, not peer reviewed (n =147)
Screening
Records screened
(n =144)
Records excluded
(n =68 not full text articles)
Records assessed for eligibility
(n =76)
Records excluded:
Reason 1 (Included the term community college(s) but was not focused on community colleges)
Reason 2 (article was about a NSF program but not S-STEM)
Included
Studies included in review
(n = 36)

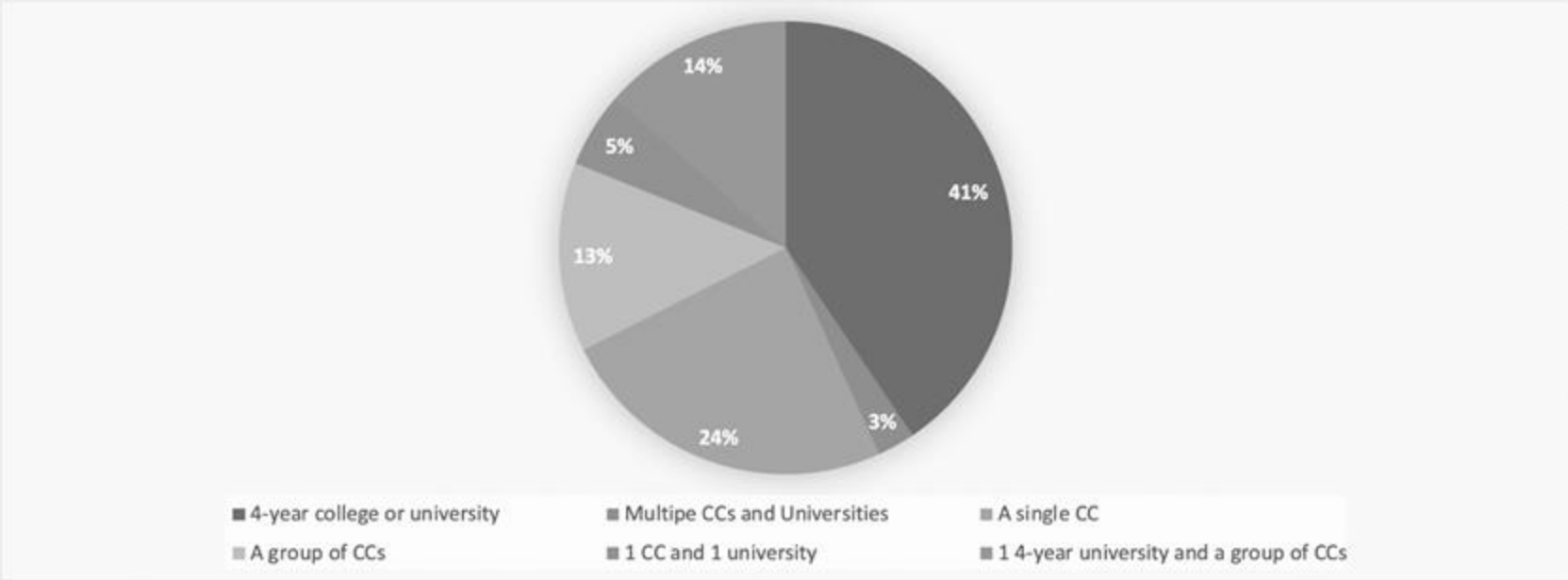
Overview of Findings

- Publication outlet
- Research Setting
- Methodological approach
- Theoretical framework
- Co and extra-curricular interventions/supports
- Themes present in articles

Publication Outlet



Research Setting



Methodological Approaches

33% reports by grant Pis

22% Quantitative

16.6% Qualitative

13.8% Mixed-Methods

11.11% not categorized

Theoretical Frameworks

Cultural and Social Capital (Bourdieu, 2011)	Situated Learning (Lave, 1990)
Self-Efficacy (Bandura, 1977)	Transformative Learning (Meizrow, 1991)
Social Learning Theory (Bandura, 1971)	Role Identity Theory (Stryker & Burke, 2000)
Sense of Belonging (Strayhorn, 2018)	Departure (Tinto, 1975)
Identity Development (Hug, 2018)	Transition Theory (Schlossberg, 1981)

Co and extra-curricular interventions/supports

Faculty development programs	Curriculum development	Faculty Research	Faculty mentorship
Faculty advising	Student peer tutoring	Student writing workshops	Student bridge programs
	Student peer mentoring	Student co-horts	

Themes

program
success
student
academic
transfer
support
belonging
community
challenges
engineering
work
career
time
motivation
effectiveness
identifying
enhance
especially
pathways
within
amount
findings
study
social
stem
s-stem
including
impact
implementation
family
model
working
recruiting
experiences
despite
information
staff
scholarship
due
building
scholars
students
development
identity
group
activities
retention
sense
learning
financial
barriers
research
project
responsibilities
engagement
hours
two
themes
mentoring
ethnicity
shock
recommendations
article
diversity
scientific
participants
employment
outreach
faculty
evaluation
improvement
limited
education
factors
advising
assessment
cohesiveness
workshops
enrollment
connections
lessons
rate
data
paths
talk
individual
changes
focus
pandemic
influencing
aims
programming
topics
beliefs
contributing
pursuits
graduation
integration
outlines
processes
explores
demographic
covid-19
negatively
paper
university
among
recruitment
four-year
benefits
self-efficacy
future
college
self
brcc
theory
fostering
race
cohort
structures
process
habits
gender
potential
key
per
concerns
outcomes
successful
reduced
funding
emerged
creating
institutional
peers
years
professional
resources
high
shock
analysis
learned
lessons
engaging
contributed
scientific
outreach
employment
participants
recommendations
mentoring
ethnicity
themes
hours
two
project
engagement
responsibilities
comparison
working
model
staff
information
experiences
despite
study
findings
within
amount
social
s-stem
stem
including
impact
implementation
family
belonging
support
research
transfer
student
academic

Implications

Explore research opportunities solely at community colleges

Increase detailed and robust research

There is a need to expand research that focuses on NSF S-STEM programs in community colleges, the various implementation methods, and particularly how this unique grant funding operates and supports students in community colleges.

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