

From Required to Remarkable: S-STEM Activities & What we Share About Them

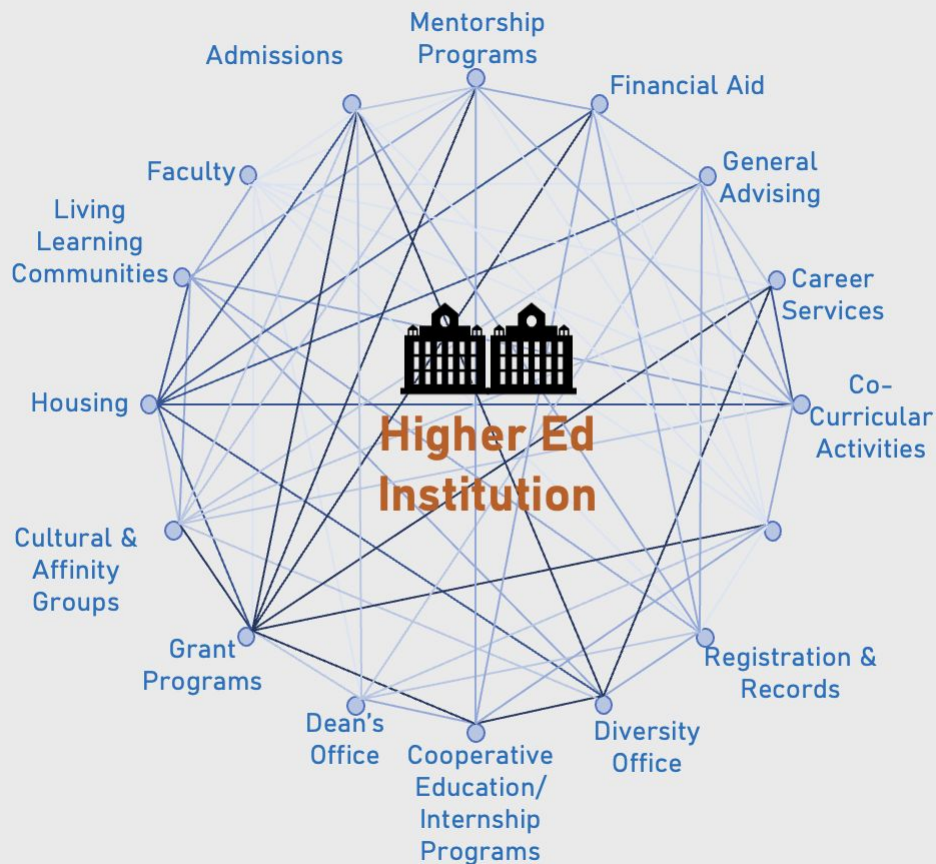


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David Knight

ROPES Hub

(Research on Organizational Partnerships in Education & STEM)

October 10, 2026



Goals

- Provide accelerator grants to S-STEM teams to create, investigate, and sustain partnerships to support students.
- Cross S-STEM program research on partnerships.

ROPES Hub - Network



VIRGINIA TECH.

NOVA

Northern Virginia
Community College



University of
CINCINNATI



The
UNIVERSITY
of
OKLAHOMA



WEBER STATE
UNIVERSITY

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Timeline

Accelerator Grants			Research			Dissemination					
Fall 2022	Spring 2023	Summer 2023	Fall 2023	Spring 2024	Summer 2024	Fall 2024	Spring 2025	Summer 2025	Fall 2025	Spring 2026	Summer 2026
Cohort 1 (10 institutions)											
			Cohort 2 (10 institutions)								
						Phase 3 (4 institutions)					
	Data Collection, Analysis, Dissemination										
Interviews			Awards, Outcome, IPEDS			Curricular Complexity			SLR		
Interviewed VT-NETS (pilot), Cohort 1, and Cohort 2 participants.			Used publicly available S-STEM award information, outcome reports, and IPEDS data.			Engaged with 10 accelerator grant teams to explore using curricular complexity maps as boundary objects.			Working with VT Libraries to compile S-STEM publications on engineering and computer science.		

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Project Stats

Accelerator Grant Institutions

24

13 of these funded twice

\$517,809

Themed Office Hours

7

83

Total Individuals from 21 institutions participated.

The Hub scaled quickly from 10 launch teams to a multi-cohort network of 24 programs, while deepening engagement through institutes, office hours, and recurring team participation.

The Hub is not just funding projects; it is creating repeated structures for collaboration, planning, and cross-institutional learning

From infrastructure to scholarship

10

Research Briefs

9

Conference Presentations

9

Published/Proposed Journal Articles

2

Dissertations

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→ Two Research Projects

1

Systematic Literature Review (SLR)

Across all of our projects, what patterns, structures, or dynamics appear again and again — regardless of institution, context, or approach?

2

Analysis of RFP S-STEM Solicitation & Isomorphism

Across all of our projects, what patterns, structures, or dynamics appear again and again — regardless of institution, context, or approach?

Systematic Literature Review (SLR)

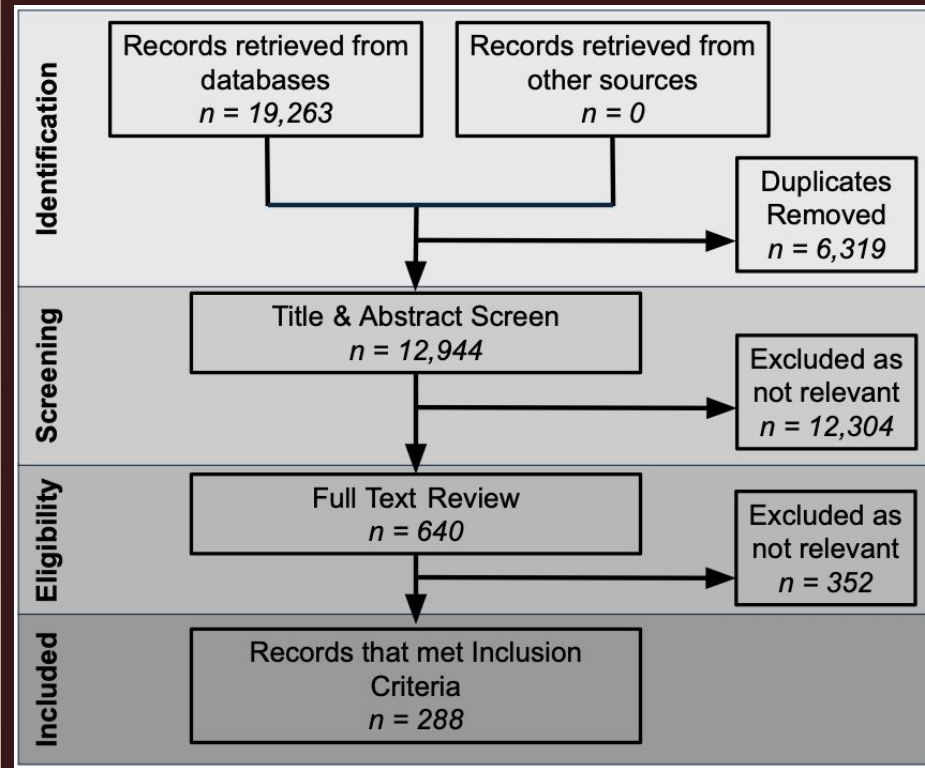
Search Terms

- S-STEM
- Engineering
- Computing
- Computer Science
- NSF

Databases

- Education Research Complete
- ERIC
- Web of Science
- IEEE Xplore
- Engineering Village
- Scopus

288
Publications



Systematic Literature Review (SLR)

Data Extracted

- Title
- Lead Author
- Date
- Product
 - Book
 - Conference Paper
 - Journal
 - Other
- Institution Name(s)
- Type
 - Overview of Program
 - Research/Evaluation
 - Other
- Outlet
 - Title of Journal or Conference
- Activities
- Partners
- Instrumentation/Data Collection
- Theory/Framework

288 Publications

Isomorphism

Definition

The tendency for organizations to become more alike—not necessarily because one approach works best, but because they face similar expectations, pressures, and ideas about what a “legitimate” program should look like.

DiMaggio, P., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields (translated by G. Yudin). *American Sociological Review*, 48(2), 147–160. <https://doi.org/10.17323/1726-3247-2010-1-34-56>

Isomorphism

Research Questions

- How does the NSF S-STEM Solicitation align with institutional program designs?
- How do S-STEM activities and programs converge and vary across institutions?

Analysis of S-STEM Solicitation & Isomorphism

Participants

- 37 S-STEM Practitioners
- 19 institutions

Data

- Semi-Structured Interviews
- S-STEM Solicitation

Analysis of S-STEM Solicitation & Isomorphism

Participants

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Data

- Semi-Structured Interviews
- S-STEM Solicitation

Required

Explicitly stated in the solicitation as a requirement of the program.

Encouraged

Stated in the solicitation and examples of how to meet the program goals.

Modified

A modified version of the required or encouraged activities/partnerships.

Extra

Anything that did not fit into the prior three categories.

What does the Solicitation say?

Co-Curricular Activities

Required

- Mentoring
- Cohort Building

Encouraged

- Seminars
- Graduate school application workshop
- Field trips
- Research opportunities
- Tutoring
- Internships
- Career Counseling
- Job Placement Services
- Conference Attendance



Do you modify any of these to fit your context?

Do you offer items outside this list?

“We’re gonna need a bigger boat.”

— Jaws

Your project is one boat. What might the larger S-STEM evidence tell us about the whole fleet?

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What does the SLR Data say?

Course-Based	64%
Career	59%
Mentor - Faculty	59%
Internship	57%
Advising	56%
Academic Support	51%
Research	49%
Mentor - Peer	45%
Conferences	35%
Field Trip	16%
Mentor - Industry	14%
Seminar	7%
Mentor - Alumni	5%
Tutoring	5%
Summer Bridge	4%
Professional Development	3%
Service	2%
Study Abroad	2%

288 Publications

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What does the SLR Data say?

Course-Based	64%	MODIFIED
Career	59%	ENCOURAGED
Mentor - Faculty	59%	REQUIRED
Internship	57%	ENCOURAGED
Advising	56%	ENCOURAGED
Academic Support	51%	ENCOURAGED
Research	49%	ENCOURAGED
Mentor - Peer	45%	REQUIRED
Conferences	35%	ENCOURAGED
Field Trip	16%	ENCOURAGED
Mentor - Industry	14%	REQUIRED
Seminar	7%	ENCOURAGED
Mentor - Alumni	5%	REQUIRED
Tutoring	5%	ENCOURAGED
Summer Bridge	4%	EXTRA
Professional Development	3%	ENCOURAGED
Service	2%	EXTRA
Study Abroad	2%	EXTRA

MODIFIED

(examples from S-STEM Leaders' interviews)

- **Faculty-Led Study Hall** - S-STEM students with a dedicated space for informal mentoring and tutoring by faculty.
- **Group Counseling** - offered group counseling for S-STEM students, building on existing services offered by a graduate program in counseling.

288 Publications

What else did we find out about co-curricular activities?

C1. Mentoring	C2.Student Support	C3. Cohort Building	C4. Classroom
Primarily integrated career preparation activities to promote mentoring and cohort building.	Leveraged the academic environment to support student success, mentoring, and cohort development.	Emphasized cohort-building experiences such as field trips, community service, and conference participation. Academic & mentoring support tended to be individualized rather than embedded within cohort-based activities.	Used bridge programs and credit-bearing courses designed specifically for academically talented, low-income students to foster success, mentoring, and cohort development.

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Guess at What We Found about Partnerships from SLR

Rank these **INTERNAL** partnerships mentioned the SLR Publications



Admissions



Academic Support



Career Support



College Departments



Financial Aid



Student Life

288 Publications

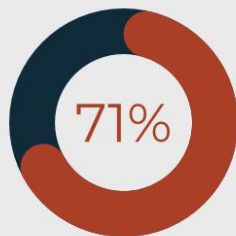
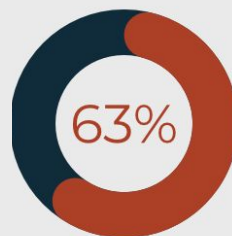
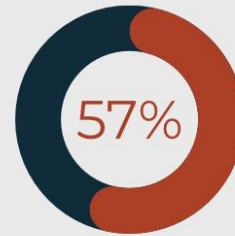


Admissions

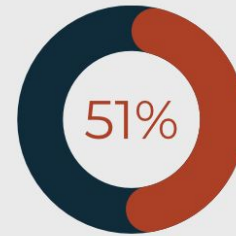
Academic
SupportCareer
SupportCollege
DepartmentsFinancial
AidStudent
Life

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Guess at What We Found about Partnerships from SLR

Academic
SupportCollege
DepartmentsFinancial
Aid

Admissions

Career
SupportStudent
Life



Admissions

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Diving Deeper....Overlooked Partnerships

In comparison with the NSF Solicitation, these Partnerships are ***Required*** or ***Encouraged***.

Our S-STEM Practitioners interviews revealed often overlooked partnerships

Overlooked Partnerships

Office of
Sponsored
Programs



Proposal preparation, reporting guidance, budgeting.

Staff



Can provide assistance in managing the S-STEM program.

Alumni



Mentoring, student resource, outreach.

Disability
Services



Student support service.

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Guess at What We Found about Partnerships from SLR

Rank these **EXTERNAL**
partnerships
mentioned the SLR
Publications



K-12
Schools



Industry



Higher
Education



Other

288 Publications



K-12
Schools



Higher
Education



Industry

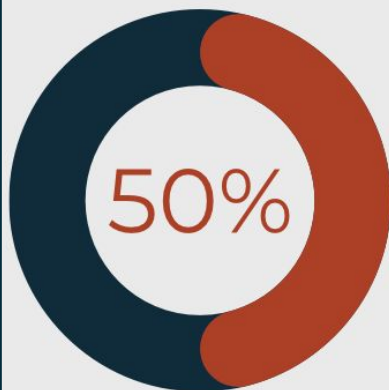


Other

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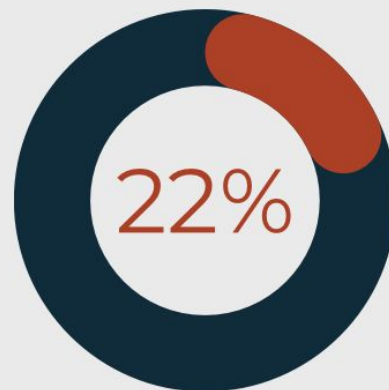
Guess at What We Found about Partnerships from SLR



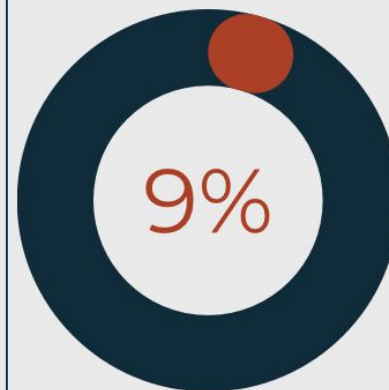
Higher
Education



Industry



Other



K-12
Schools

What else did we find out about partnerships?

Transactional	Practical Core	Confusion
Practical, purpose-specific arrangements in which partners exchange resources, services, access, or expertise to accomplish a defined goal, with limited shared planning or long-term institutional change.	Represent how programs actually function on a day-to-day basis and how institutions demonstrate alignment with accountability expectations	Many participants equated partnerships with high-visibility external collaborations, such as industry partnerships or community college transfer pathways, while overlooking or minimizing essential relationships like those with financial aid offices or institutional research units.

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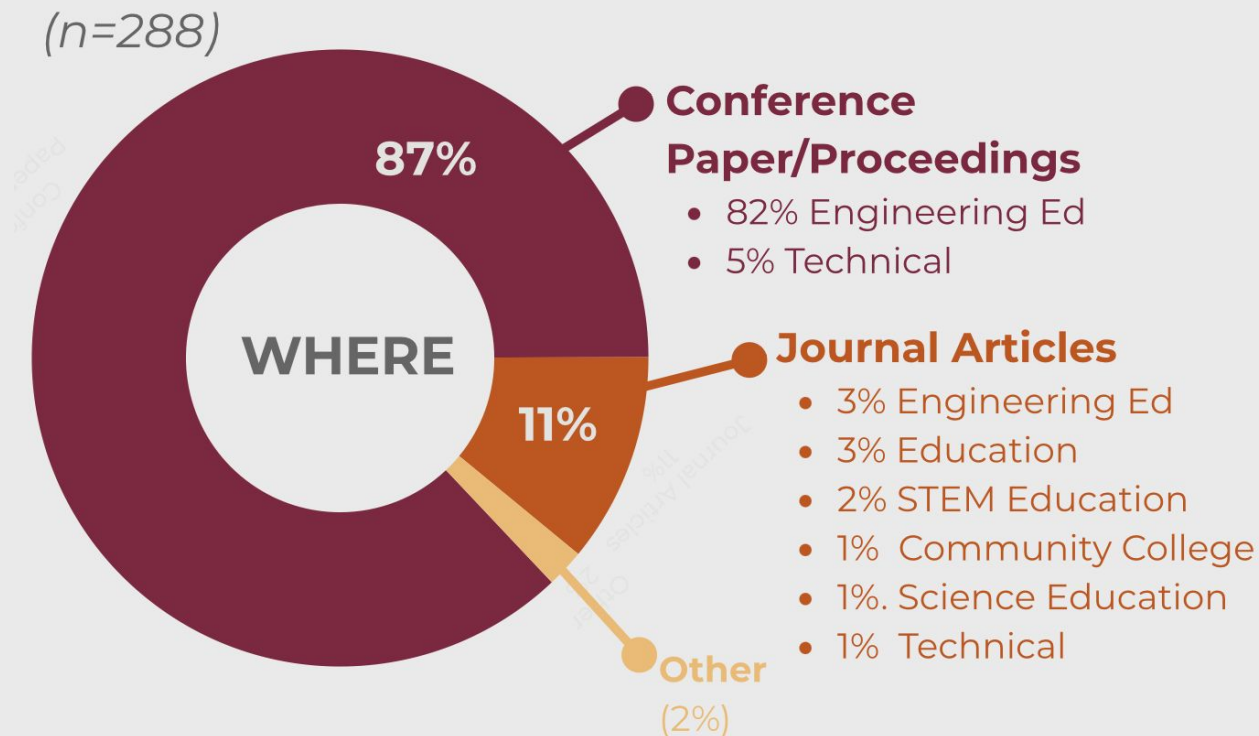


Where do we tell others about what we do....

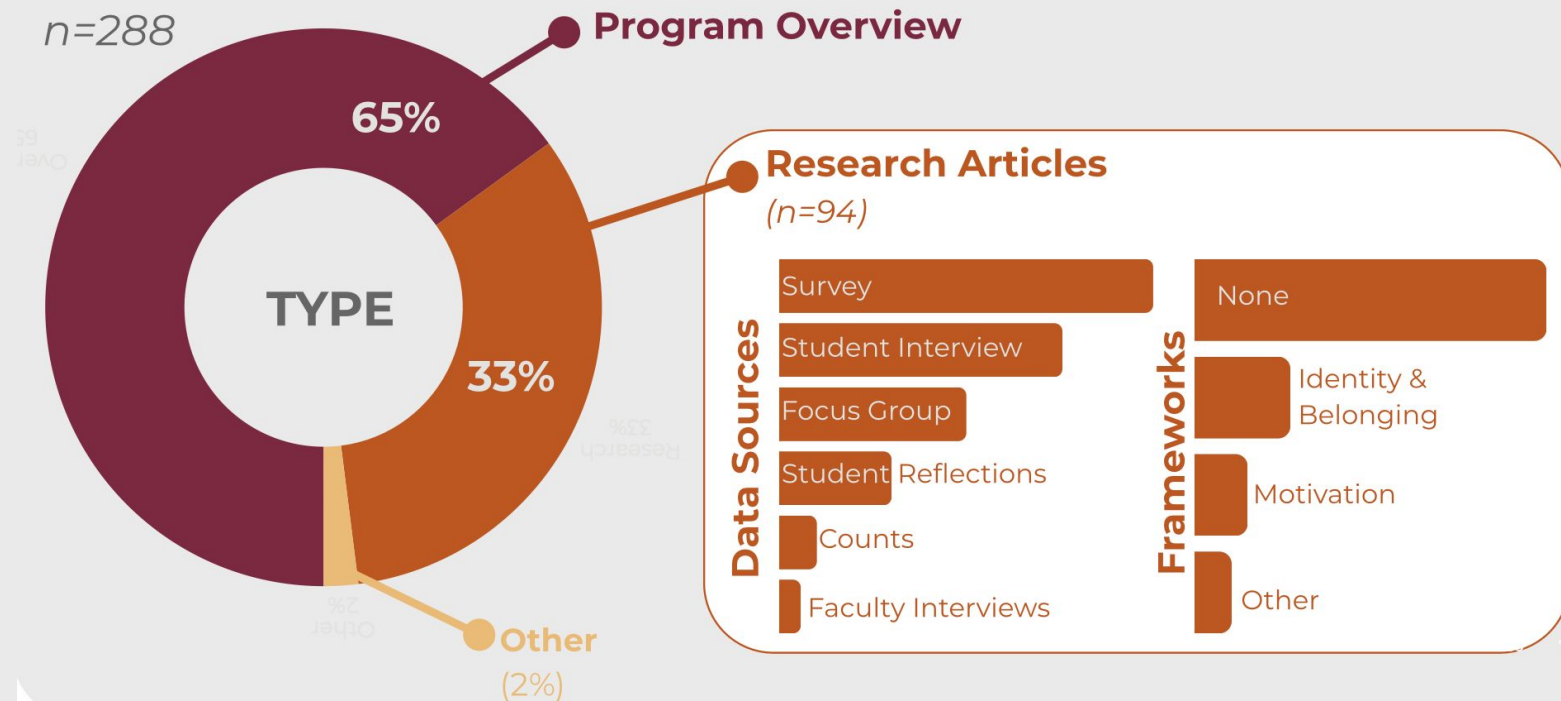
- What are the publication outlets of publications about NSF S-STEM programs in EGR/CS?
- What types of research designs, data collection methods, and analytical approaches have been used in empirical studies of EGR/CS S-STEM programs?

288 Publications

Where S-STEM Work is Published in SLR



Type of S-STEM Publications in SLR



How & Where do you share your work?



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What are some things that you heard?

Collective exchange of actionable strategies, supporting participants in refining your S-STEM efforts and learning from peers across the community.

→ Thank you



ROPES Hub Website



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Research on Organizational
Partnerships in Education & STEM



Concurrent Workshop Feedback Form