



New to First2 Network

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What is FIRST2 NETWORK ?

- Expanding group of over 1000 people and 30 organizations in WV and beyond
- **Aim:** Double the graduation rate of rural, first-generation, low-income and other underrepresented students in West Virginia with a declared major in science, technology, engineering, and math (STEM).
- **Approach:** **changing systems** that hold problems in place
 - working in true partnership with student leaders
 - testing and learning with stakeholders to share and scale high-impact practices
 - re-examining policies, procedures and resource allocation
- National Science Foundation INCLUDES Alliance with 5 collaborating PI organizations since 2018; actively seeking funding for sustainability

Elements of INCLUDES

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science - One of NSF's Big 10 Ideas



1. **Shared vision:** Engage and support rural, first-generation and other underrepresented students and work with systems and institutions to develop practices and policies that better serve these students
2. **Partnerships:** Convene education, non-profit, government, and industry partners
3. **Goals and Metrics:** Implement shared measures and support members in testing solutions and tracking progress toward goals
4. **Leadership & Communication:** Demonstrate collaborative, representative leadership that elevates the voice of student co-creators. Build diversity, inclusion, and equity.
5. **Expansion, Sustainability & Scale:** Utilize Steering Committee, Improvement Science and Student Leadership to coordinate best practices and outreach to other organizations and institutions

Partners

Higher Education



Industry



Non-Profit



Government



Other Organizations



FIRST2 DRIVER DIAGRAM: A look at how First2 Network plans to achieve central goals.

PRIMARY DRIVER #1

STEM Students
succeed academically

PRIMARY DRIVER #2

Connections to
institutional team to
promote belonging

Central Aim of the FIRST2 NETWORK:

Double the graduation rate of
rural, first-generation and other
underrepresented students in
West Virginia with a declared
STEM major.

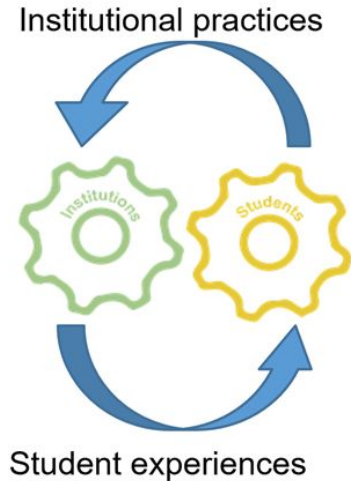
PRIMARY DRIVER #3

Connections for
research and career

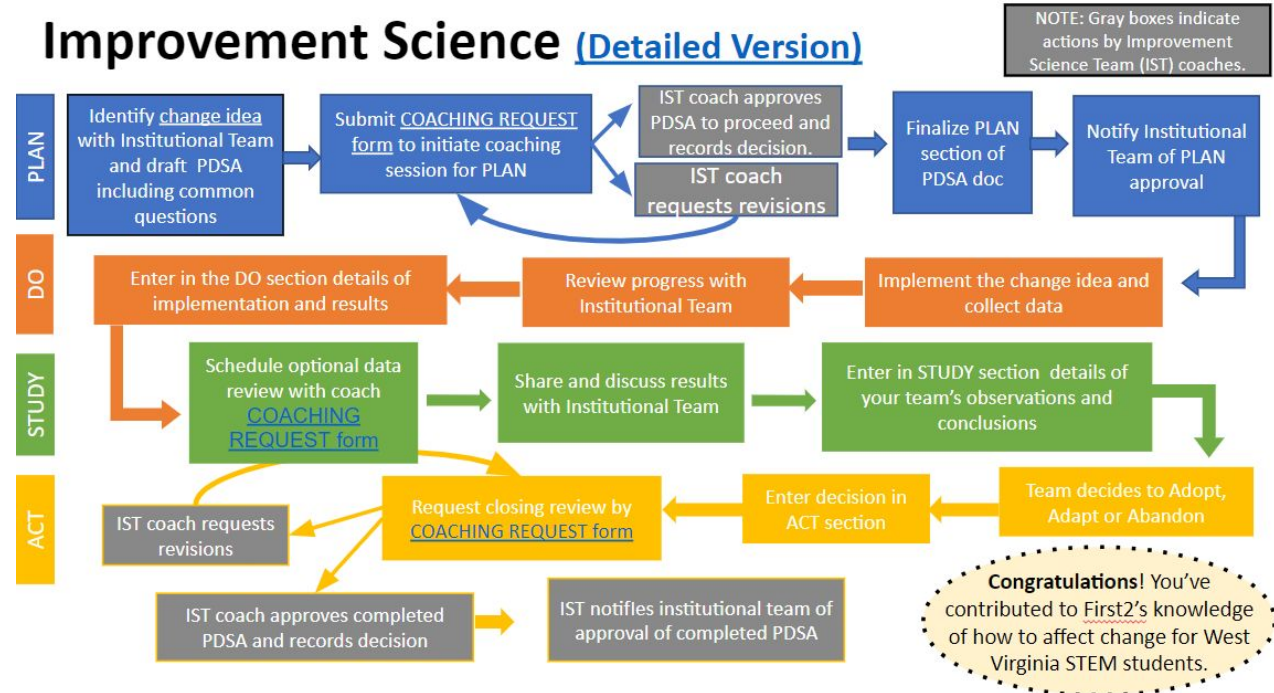
PRIMARY DRIVER #4

Leadership
experience

Improvement Science for Systems Change

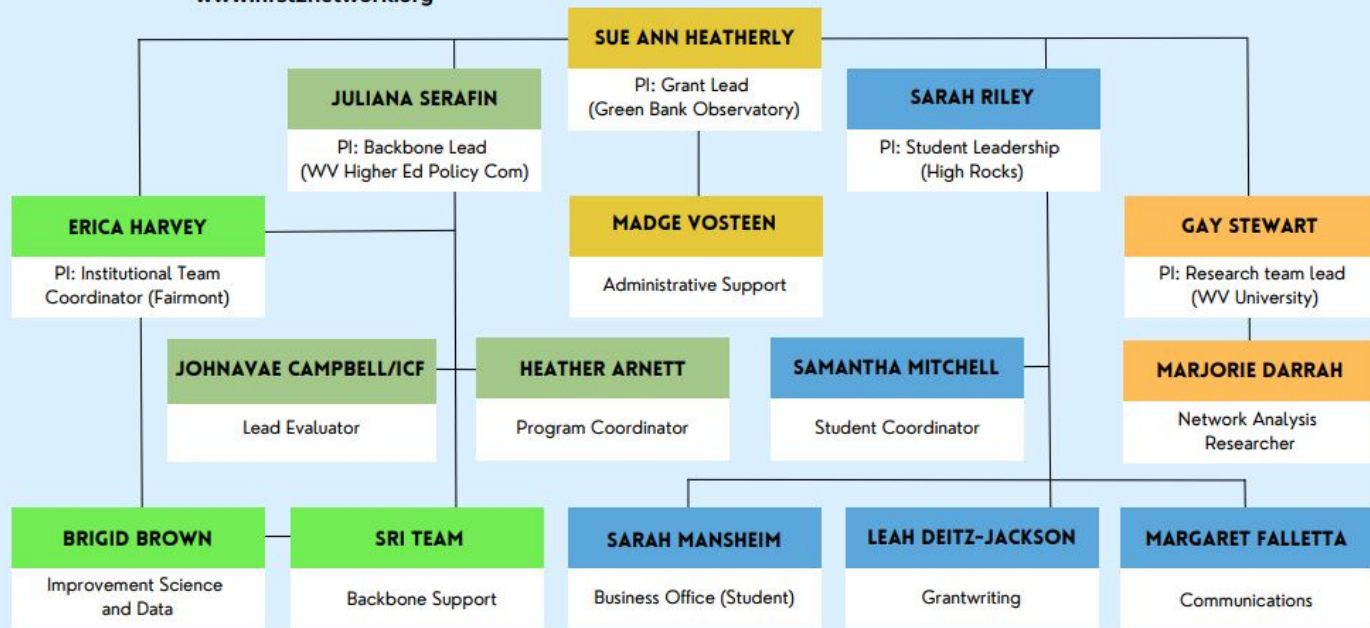


Improvement Science [\(Detailed Version\)](#)



First2 Organization (over 1000 members)

- Members = you!
- Institutional teams - students, faculty, staff, administrators
- Leadership and Support:
 - Steering Committee
 - Student Leadership Team
 - Industry Advisory Board
 - External Advisory Board
 - Leadership Team (PI's)
 - “Backbone”



The First2 Network is an expanding group of people and organizations working to increase the number of college graduates in science, technology, engineering, and math (STEM) to strengthen our communities and drive an innovation economy in West Virginia and beyond. First2 focuses on rural, first-generation, low-income, and other underrepresented STEM students, making sure all our students can succeed regardless of zip code, gender, race, or income. First2 works in true partnership with student leaders, tests and learns with stakeholders to share and scale high-impact practices, and drives systemic change through informed policy and resource allocation.

Changing Systems through Improvement Science

- Higher Education Institutional Teams test change ideas
 - Plan-Do-Study-Act Cycles (PDSAs)
 - [Templates](#) for high impact practices
 - [Coaching Request](#) to Improvement Science Team
 - [Common Questions](#) for cross-institution data sharing
 - Centering lived realities
- Goal:
 - Systems Change
 - Scalability
 - Sustainability

Student Leadership

- Student Scholars
 - 50 hours/semester; \$750
 - 100 hours/semester; \$1500
- Student Directors
 - 150 hours/semester; \$2500
- Student Co-Chairs
 - 240 hours/semester \$4000
- High Impact Practices



Campus Clubs

Campus clubs

- Student initiated change idea
- Each First2 campus has a club
- Led by students

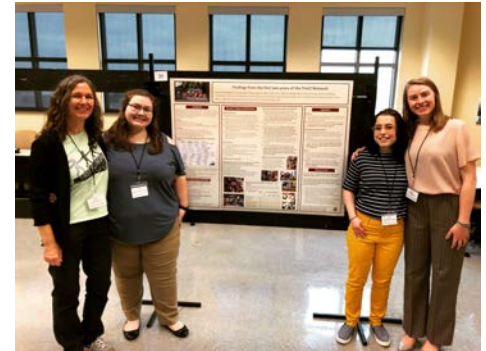
Students:

- Budget
- Monthly reports
- Academic and social support
- Test change ideas as part of institutional team



Outreach and Advocacy

- First2 students go to
 - conferences
 - legislative sessions
 - high school classrooms
 - meetings with administrators
- Discuss experiences and perspectives as a college student
- Practice and confidence in networking, public speaking and presentation skills



Immersive Bridge/Research Programs

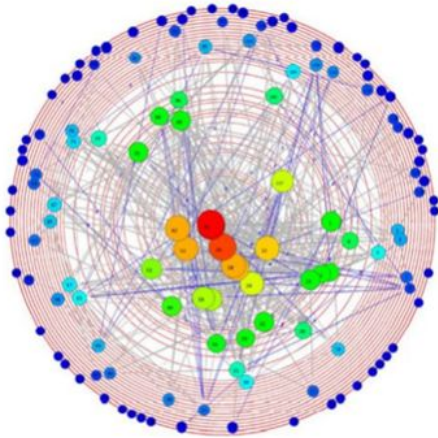


- Short-duration (3-14 summer days)
- Rising freshmen
- Introduces college
- Students experience research
- Increases sense of STEM self-efficacy and belonging
- Builds community with peers, peer mentors, research faculty and staff

Jandy, H., Carreon, H., Fultz, M., Harvey, E., Howley, C., Norton, M., Richards-Babb, M., Riley, S., Sine, A., & Heatherly, S. A. (2021). Impact of Short-Duration Research Experiences on STEM Self-Efficacy among Early-Stage, Rural, First-Generation College Students. Scholarship and Practice of Undergraduate Research.
<https://doi.org/10.18833/spur/4/4/8>



Network connectivity correlates with STEM persistence



Year 3 (2020/2021)

Social Network
Analysis

Year 2 finding: 39 of 48 student participants retained in STEM majors

Average connection strength to network:

Retained: 2.8

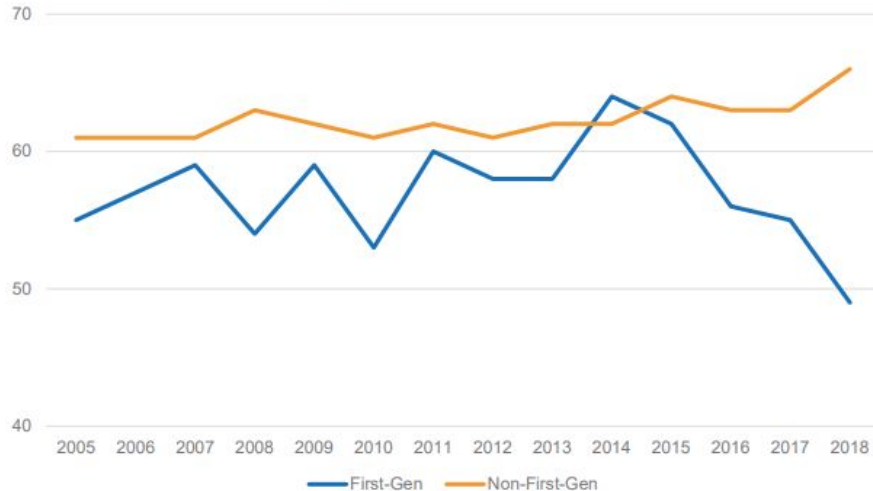
Not retained: 2.3



Darrah, M., Cowley, K., Wheatley, C., Humbart, R., & McJilton, L. (2022). Analyzing the Growth of a Statewide Network to Increase Recruitment to and Persistence in STEM. *Journal of Appalachian Studies*, 28(2), 188-212. <https://doi.org/10.5406/23288612.28.2.05>

First2 and Student Persistence

Figure 30. 1-Year Persistence Rates (Percentages) for WVU STEM Students by First-Generation Status



STEM fall-to-fall persistence for First2 Network*

- 71% for first-time freshmen (35 of 49 students; Fall 2018-2021 cohorts)
- 72% for sophomores and higher* (65 of 90 students; Fall 2018-22)



<https://first2network.org/wp-content/uploads/2023/11/Evaluation-year5.pdf>

First2 and Student Persistence - WVU Proxy

423 WVU STEM majors participated in First2 or a network PDSA

47% remained enrolled in a STEM major

**27% comparison WVU STEM persistence rate.

53% left STEM major:

3% switched to a STEM-adjacent major

4% switched to a health-related major

25% switched to a non-STEM degree

21% dropped out of college



<https://first2network.org/wp-content/uploads/2023/11/Evaluation-year5.pdf>

Acknowledgements

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First2 Network staff

First2 Network Student Directors

First2 Network members

Session participants - you!



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