NSF INCLUDES: Leveraging Precollege STEM Programs for Broadening Participation in Undergraduate STEM

Dr. Alaine M Allen, University of Pittsburgh

Dr. Alaine M. Allen is an educator who opens doors for students, particularly individuals from groups historically marginalized in science, technology, engineering and mathematics, and she is committed to creating a culture of inclusive excellence in STEM environments. Dr. Allen is the director of K-12 Outreach and Community Engagement in the University of Pittsburgh, Swanson School of Engineering and a co-director of the Broadening Equity in STEM Center at the University of Pittsburgh, a center charged with creating a national network for STEM precollege programs and a local network of undergraduate STEM programs designed to broaden participation. Dr. Allen has a Bachelor of Science degree in physics education from Lincoln University of Pennsylvania, a Master of Education degree in policy, planning and evaluation and a Doctor of Education degree, both from the University of Pittsburgh. .

Dr. Jennifer Iriti, University of Pittsburgh

Jennifer Iriti, Research Scientist and Director of the Evaluation for Learning Group at the University of Pittsburgh, designs and manages mixed-methods evaluations of education initiatives in PK-20 settings to support educational policy- and decision-makers. Most recently, she has focused evaluation efforts on programs that support postsecondary access and success, such as the Pittsburgh Promise and as Co-PI for an NSF INCLUDES grant to increase college access for underrepresented populations in STEM. She holds a doctoral degree in Developmental and Educational Psychology and a certificate in Interdisciplinary Policy and Evaluation from the University of Pittsburgh.

Mackenzie Ball, University of Pittsburgh

Mackenzie is the Director of Outreach and Alumni Engagement for the University of Pittsburgh School of Computing and Information. Mackenzie is responsible for the strategic planning, creation, implementation, and overall management of the school's plan and vision for outreach and alumni engagement, including all school-wide events focused on outreach and diversity. She oversees diversity programs and the recruitment of high school students and under-represented groups to the School of Computing and Information. Also, she manages the school's alumni engagement and events, including alumni communications and scholarships. Mackenzie is the Program Director for the school's Technology Leadership Initiative, Advisor to the Women in Computer Science Club and the Computer Science Club, and the Chair of the National Center for Women & Information Technology (NCWIT) Western PA Affiliate and Academic Alliance member. Lastly, Mackenzie was senior personnel on an NSF INCLUDES DDLP "Diversifying Access to Urban Universities for Students in STEM Fields." and 2019 – 2024, and is currently Senior Personnel "NSF INCLUDES Alliance: The STEM PUSH (Pathways for Underrepresented Students to HigherEd) Network" ($10,000,000). She is also a member of the leadership team for the University of Pittsburgh's Broadening Equity in STEM Center (BE STEM).

Dr. Rebecca Gonda, University of Pittsburgh

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Where Our Journey Began

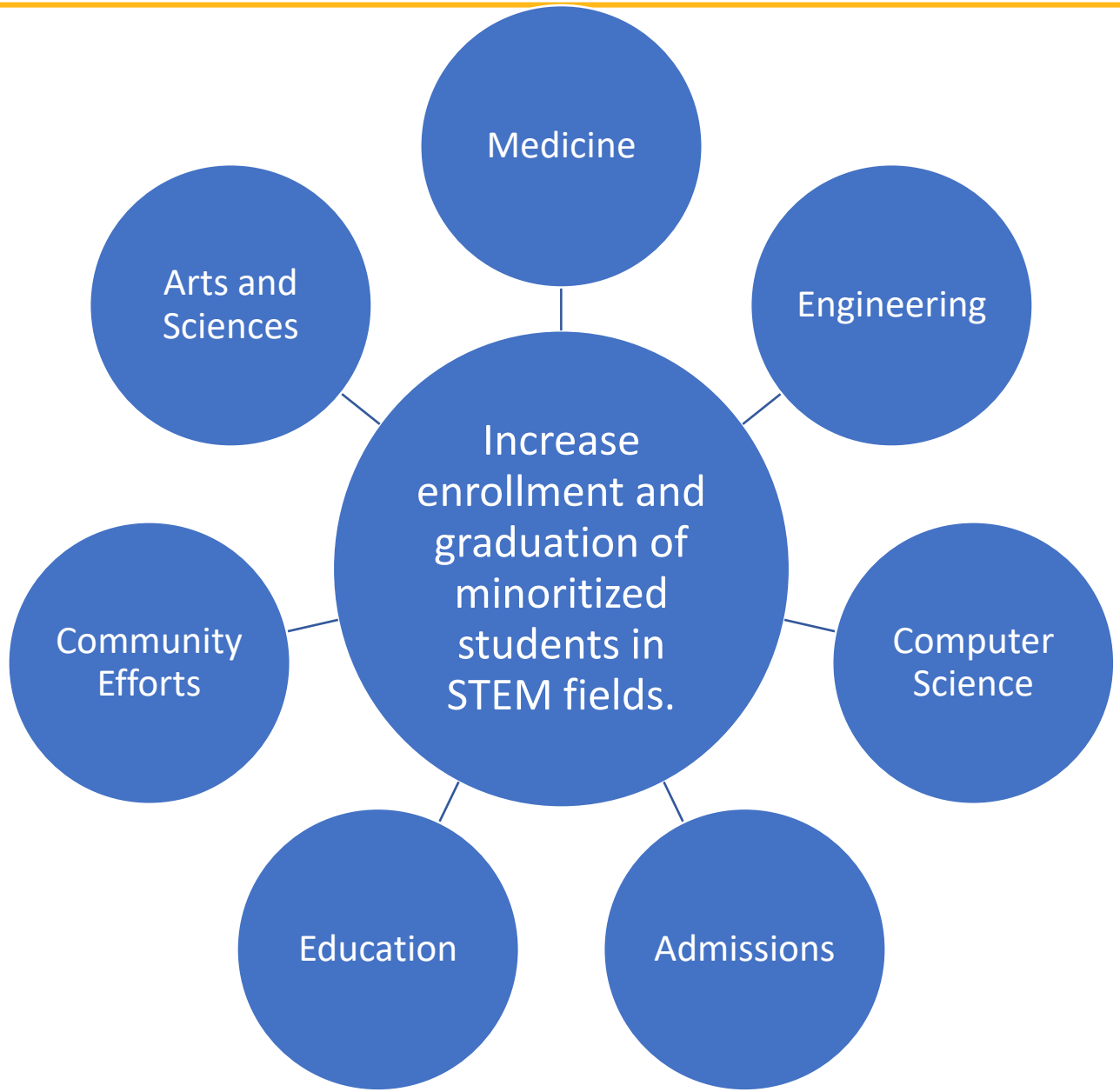
Diversity in precollege STEM programs that prepare students for STEM UG

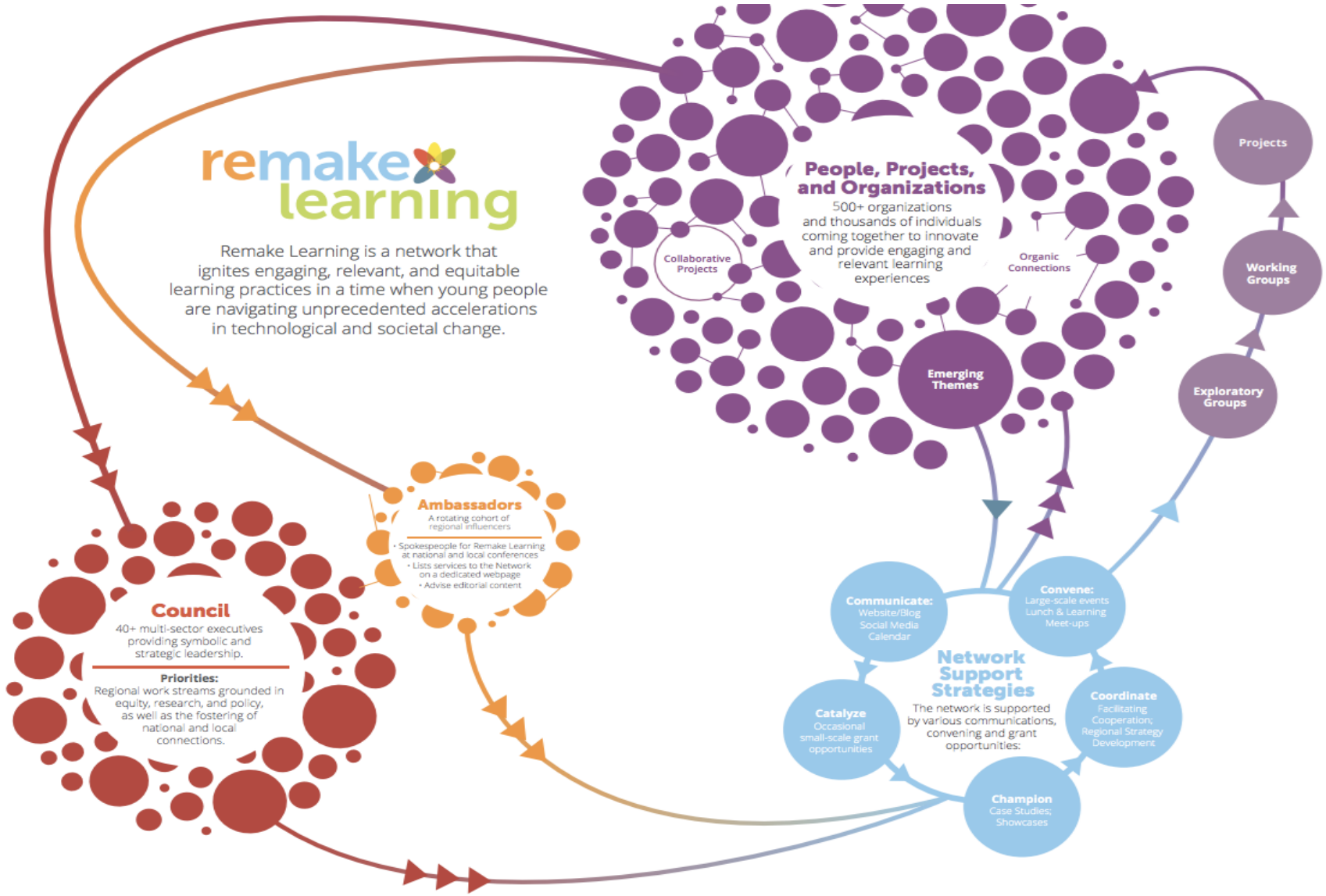
Lack of diversity in college admission and graduation in STEM

- INCLUDES DDLP – Focused on increasing access of a diverse group of students to an urban research university
- INCLUDES Alliance – Focuses on expanding the effort from the original pilot grant to a national stage

The goal of the project is to create a national network of STEM precollege programs in urban areas that can be leveraged to increase the admissions and graduation of underrepresented students of color in STEM.

Broadening Participation Efforts at the University of Pittsburgh




remake learning
Remake Learning is a network that ignites engaging, relevant, and equitable learning practices in a time when young people are navigating unprecedented accelerations in technological and societal change.
People, Projects, and Organizations
500+ organizations and thousands of individuals coming together to innovate and provide engaging and relevant learning experiences
Collaborative Projects
Organic Connections
Emerging Themes
Projects
Working Groups
Exploratory Groups
Ambassadors
A rotating cohort of regional influencers
• Spokespeople for Remake Learning at national and local conferences
• Lists services to the Network on a dedicated webpage
• Advise editorial content
Council
40+ multi-sector executives providing symbolic and strategic leadership.
Priorities:
Regional work streams grounded in equity, research, and policy, as well as the fostering of national and local connections.
Network Support Strategies
The network is supported by various communications, convening and grant opportunities:
Communicate:
Website/Blog
Social Media
Calendar
Convene:
Large-scale events
Lunch & Learning
Meet-ups
Catalyze
Occasional small-scale grant opportunities
Coordinate
Facilitating Cooperation; Regional Strategy Development
Champion
Case Studies; Showcases

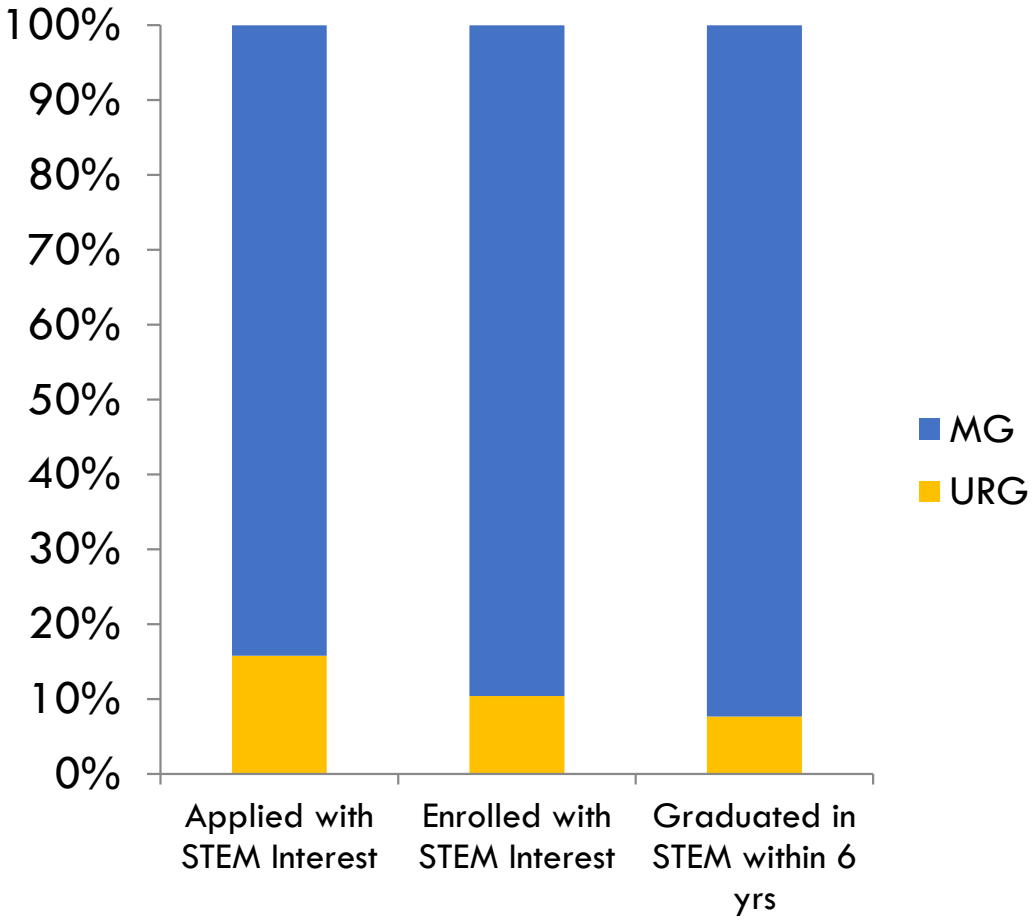
Awarded NSF INCLUDES Design and Development Launch Pilot (DDLP): Diversifying Access to Urban Universities for Students in STEM Fields

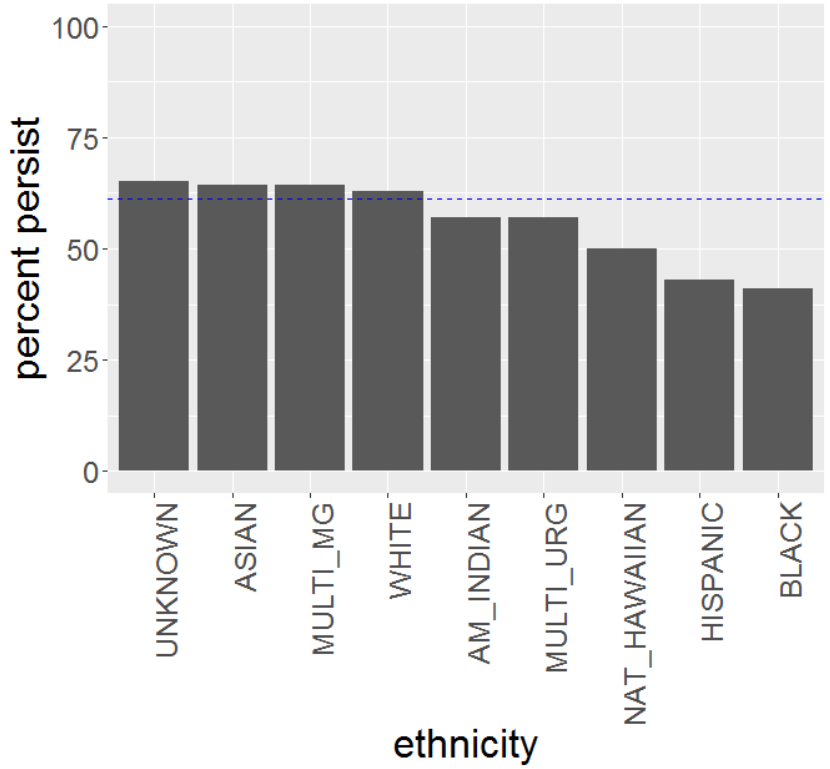
1	Create a community engagement framework to help recruit underserved students to precollege STEM programs.
2	Develop a STEM Success Matrix that identifies student competencies acquired in precollege programs to prepare students for collegiate success in STEM
3	Develop a model to credential precollege programs based on their ability to prepare students in alignment with the STEM Success Matrix.
4	Develop a model to communicate the value of students' precollege program participation for consideration within holistic admissions review at research universities.

NSF INCLUDES DDLP Results

- 12 years of Admissions Results
- Community Engagement Analysis
- STEM Success Matrix
- Quality Standards for PCSP to Broaden Participation

Current admissions metrics contribute to lack of diversity because they are not an accurate indicator of persistence in STEM

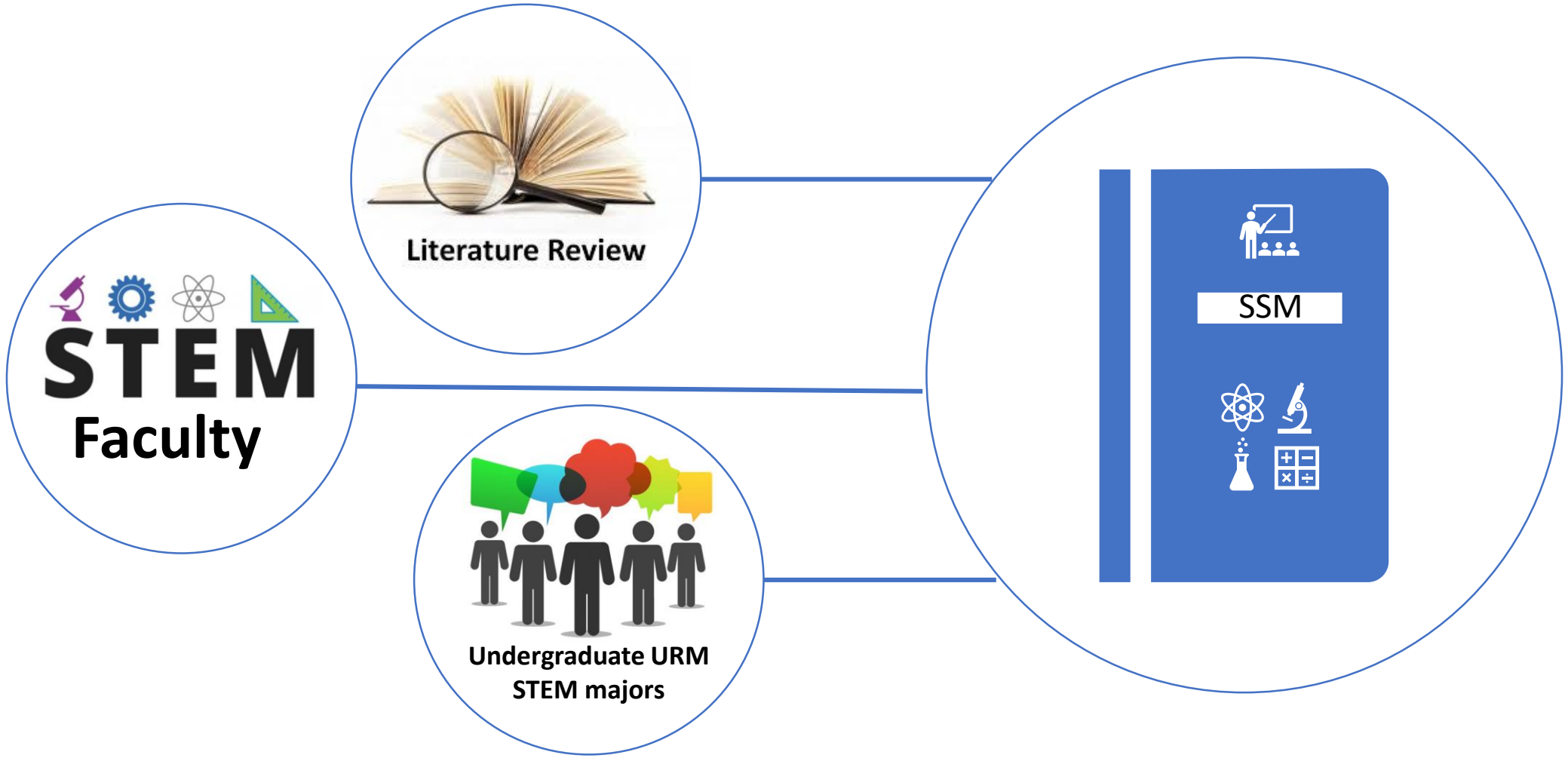




Community Engagement is Paramount

- Go to spaces where youth already are
- Demonstrate the relevance of STEM to youth's families, communities and interests.
- Include outside identification and referrals.
- Build and engage relationships with other youth-serving organizations.
- Employ a variety of media and materials
- Align recruitment and retention
- Address (and highlight) barriers to participation

STEM Success Matrix (SSM)



STEM Success Matrix (SSM) - continued

Knowledge and Skills

- Awareness of STEM opportunities
- Awareness of the college application & financial aid process
- Communication skills (verbal and written)
- Critical thinking, problem solving or scientific reasoning skills
- Reading comprehension skills
- Understanding of math concepts

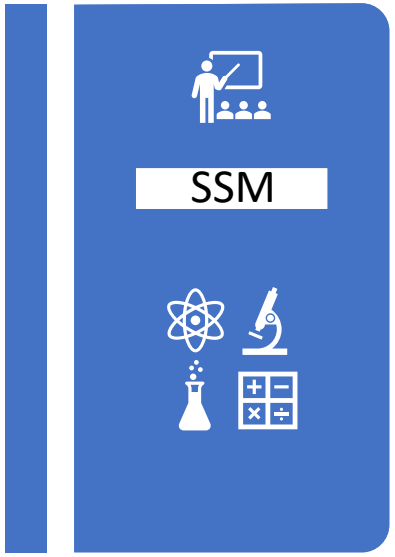
Habits of Mind

- Ability to take risks and accept failure
- Collaboration
- Curiosity
- Ownership of learning
- Persistence
- Relevance of STEM
- Responsibility
- Sense of belonging/STEM Identity

Broadening Participation Quality Standards

Community
Focused
Engagement

+



Quality Standards

Broadening Participation Quality Standards

- Program Goals
- Student Recruitment
- Program Design and Implementation
- Student Services
- Assessment and Evidence of Performance
- College Pathways

Program Goals

Student Recruitment

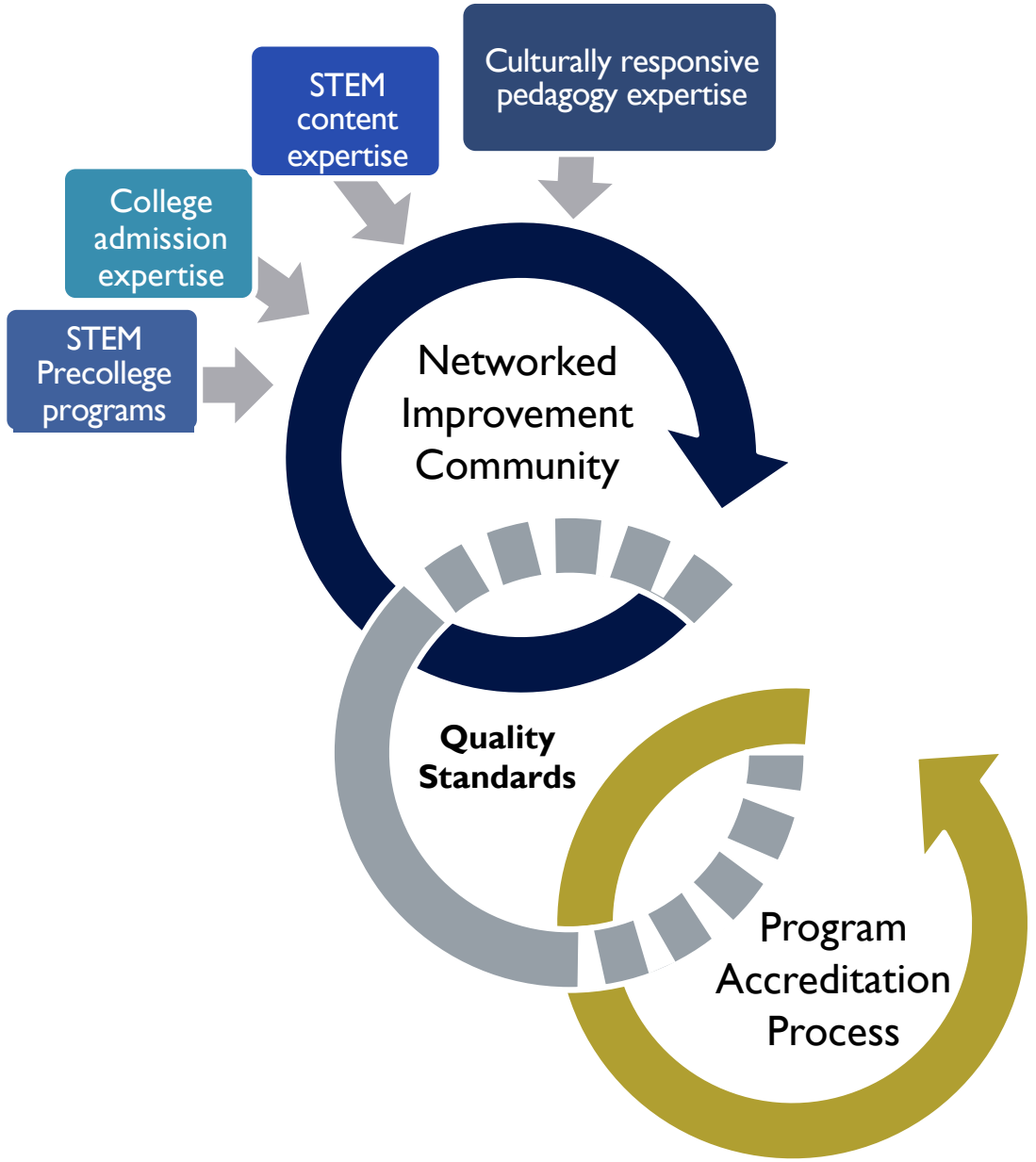
Program Design and Implementation

Student Services

Assessment and Evidences of Performance

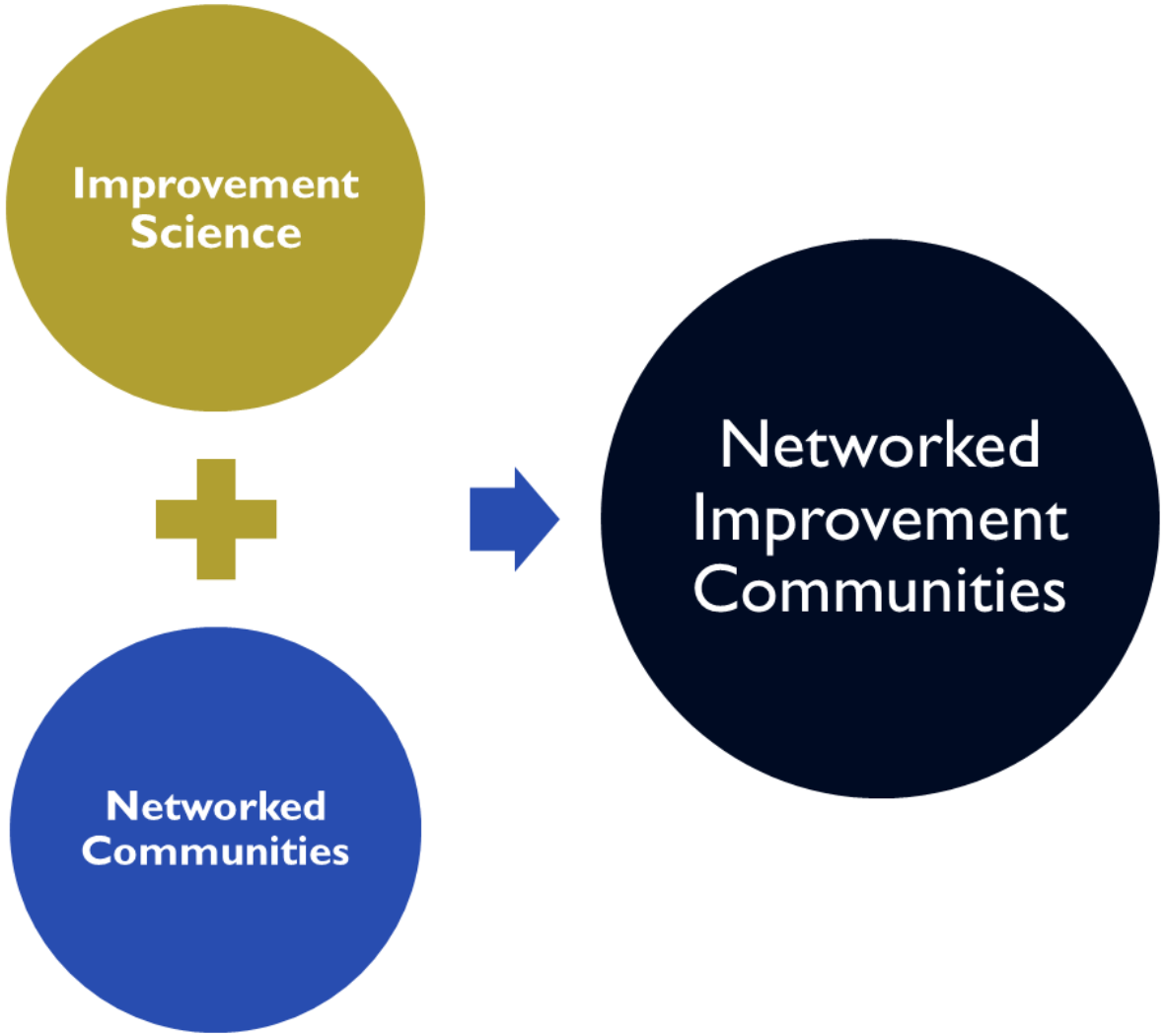
College Pathways

Next Steps - NSF INCLUDES Alliance: STEM Pathways to Underrepresented Students in HigherEd (PUSH) Network

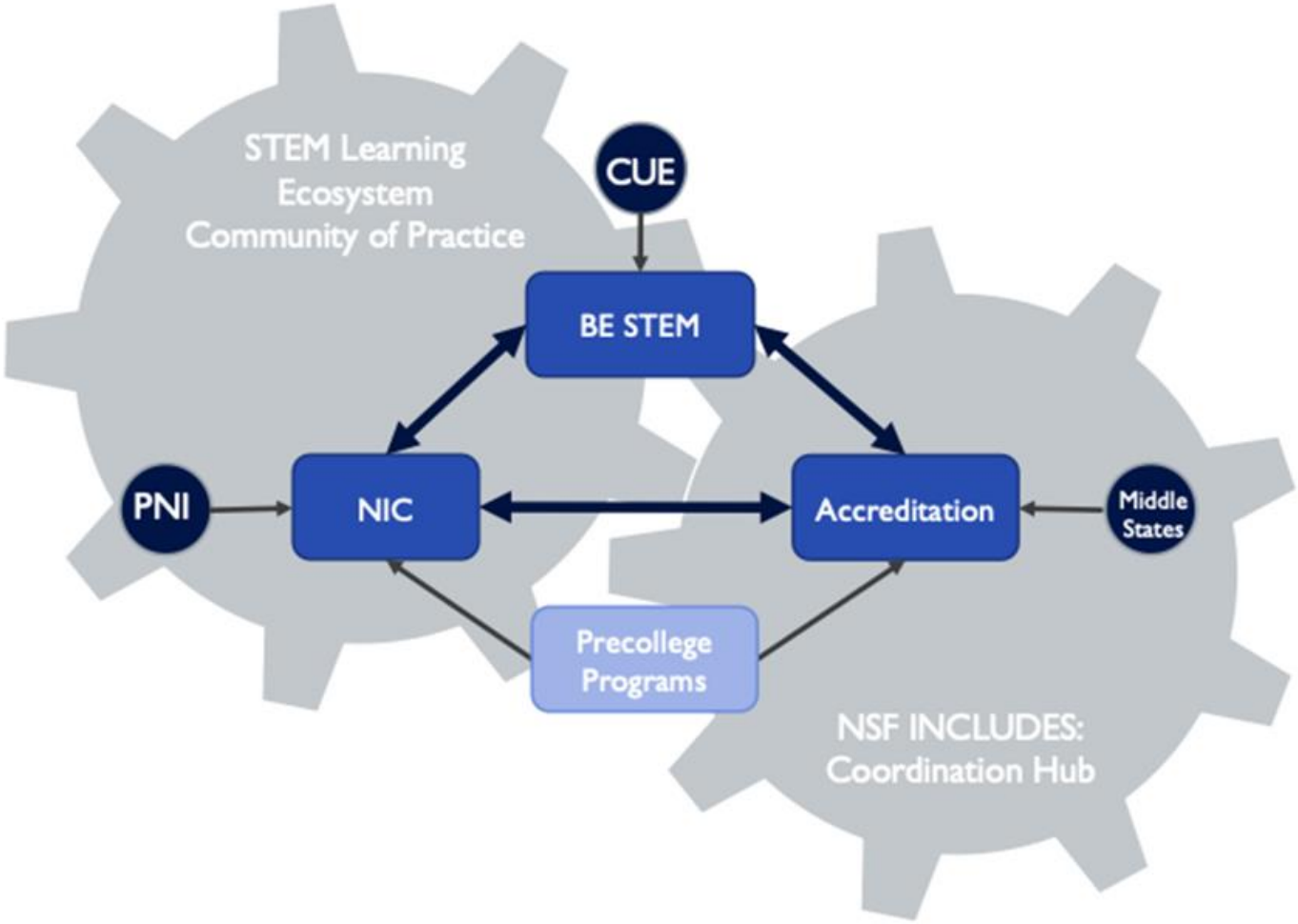


Networked Improvement Community

- Integrating Two Big Ideas:
- The tools and technologies of
- Improvement Science
- joined with
- The Power of Networks



NSF STEM PUSH Network: A National Alliance of PCSP



QUESTIONS?

This Alliance is funded by the National Science Foundation Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES), a comprehensive national initiative to enhance U.S. leadership in discoveries and innovations by focusing on diversity, inclusion and broadening participation in STEM at scale. It is also co-funded by the NSF Innovative Technology Experiences for Students and Teachers (ITEST) program and Advancing Informal STEM Learning Program (AISL).