The (STEM)^2 Network

A Multi-Institution, Multidisciplinary Approach to Transforming Undergraduate STEM Education

Alison Hyslop, St. John's University

Jessica Santangelo, Hofstra University

Why are we here?

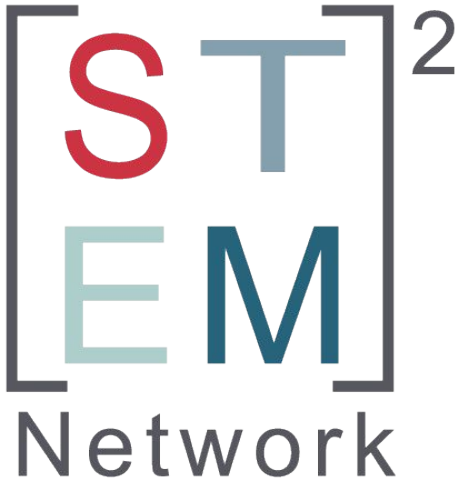
Our goals:

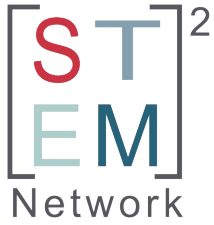
- Describe the $(STEM)^2$ Network model
- Share outcomes from our $(STEM)^2$ Network

Our goals for you:

- Develop a vision for implementing the $(STEM)^2$ Network model in your area

(Join our workshop on June 18, 2021)





Area of Focus 1

Area of Focus 2

Area of Focus 3

Area of Focus *m*

Disciplines

Institution 1

Institution 2

Institution 3

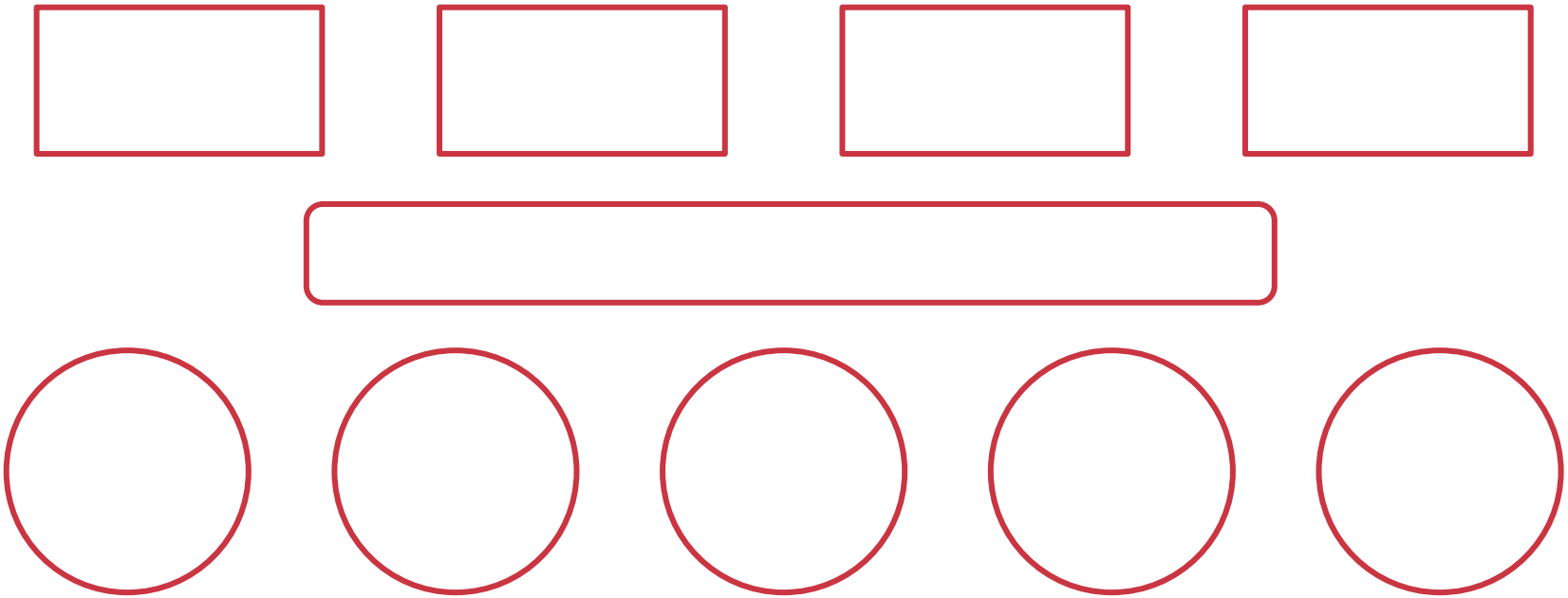
Institution 4

Institution *n*

Community of Transformation

Systems Design

Emergent Outcomes



Community of Transformation

Systems Design

Emergent Outcomes

An adaptable model

Model's Infrastructure

- Foundational Frameworks
- Multiple Institutions
- Multiple Disciplines

Intentional Self-Reflection

Model's Adaptable Design

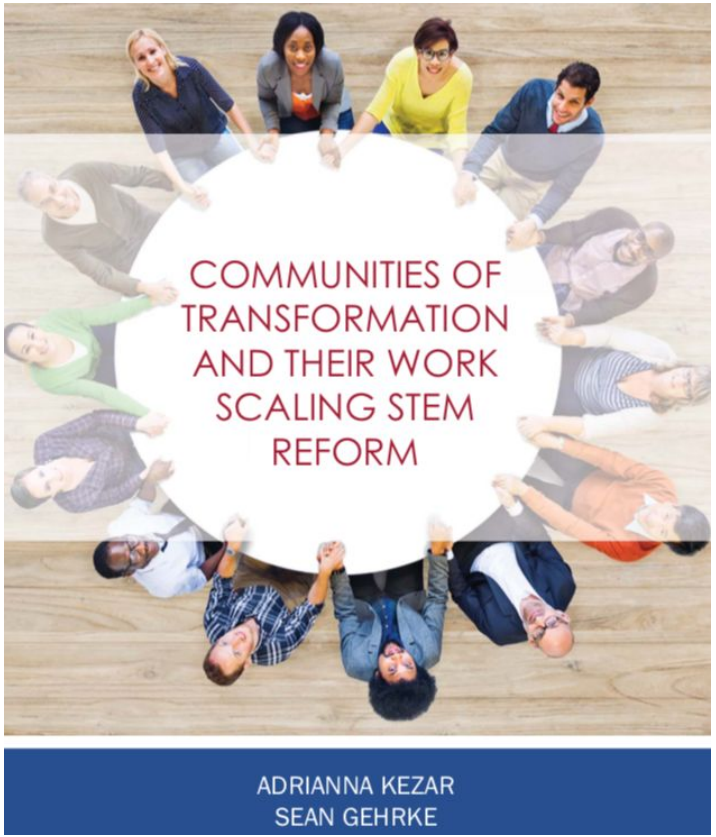
- Which Institutions
- Types of Institutions
- Which Disciplines
- Areas of Focus

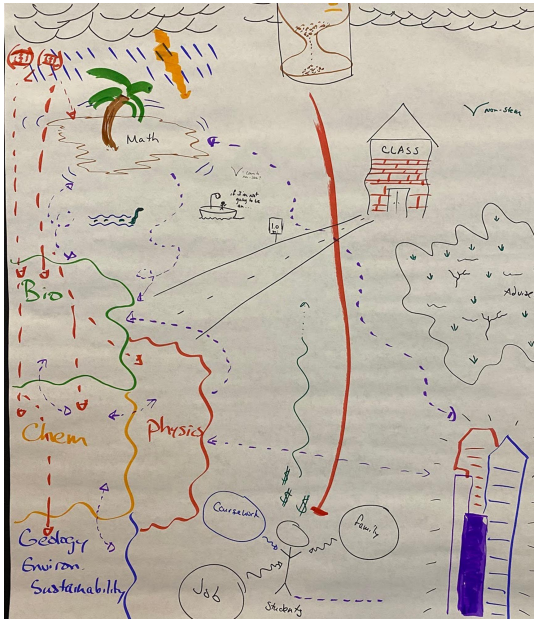
- “[explore] philosophically, in deep and fundamental ways, how science is taught.”
- Individuals and the broader system

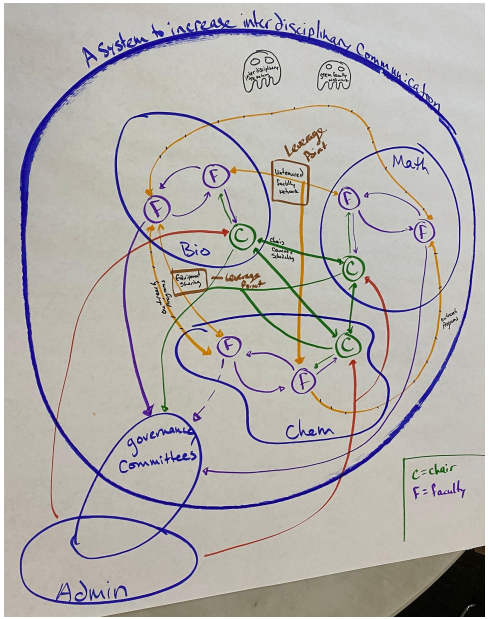
Benefits: Particularly for Faculty of Color and Female Faculty

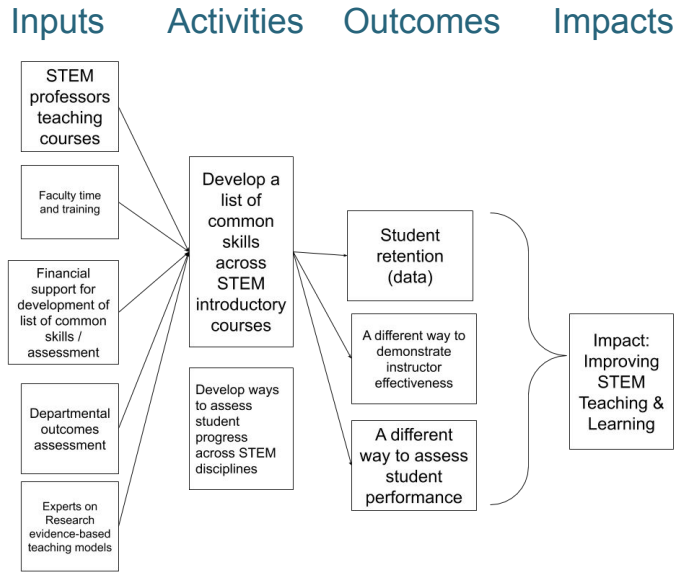
- Networking
- Pursuing grant opportunities
- Credibility for professional work
- Skills to move from faculty to administration
- Skills in leadership and change
- Contributing to career advancement

Community of Transformation



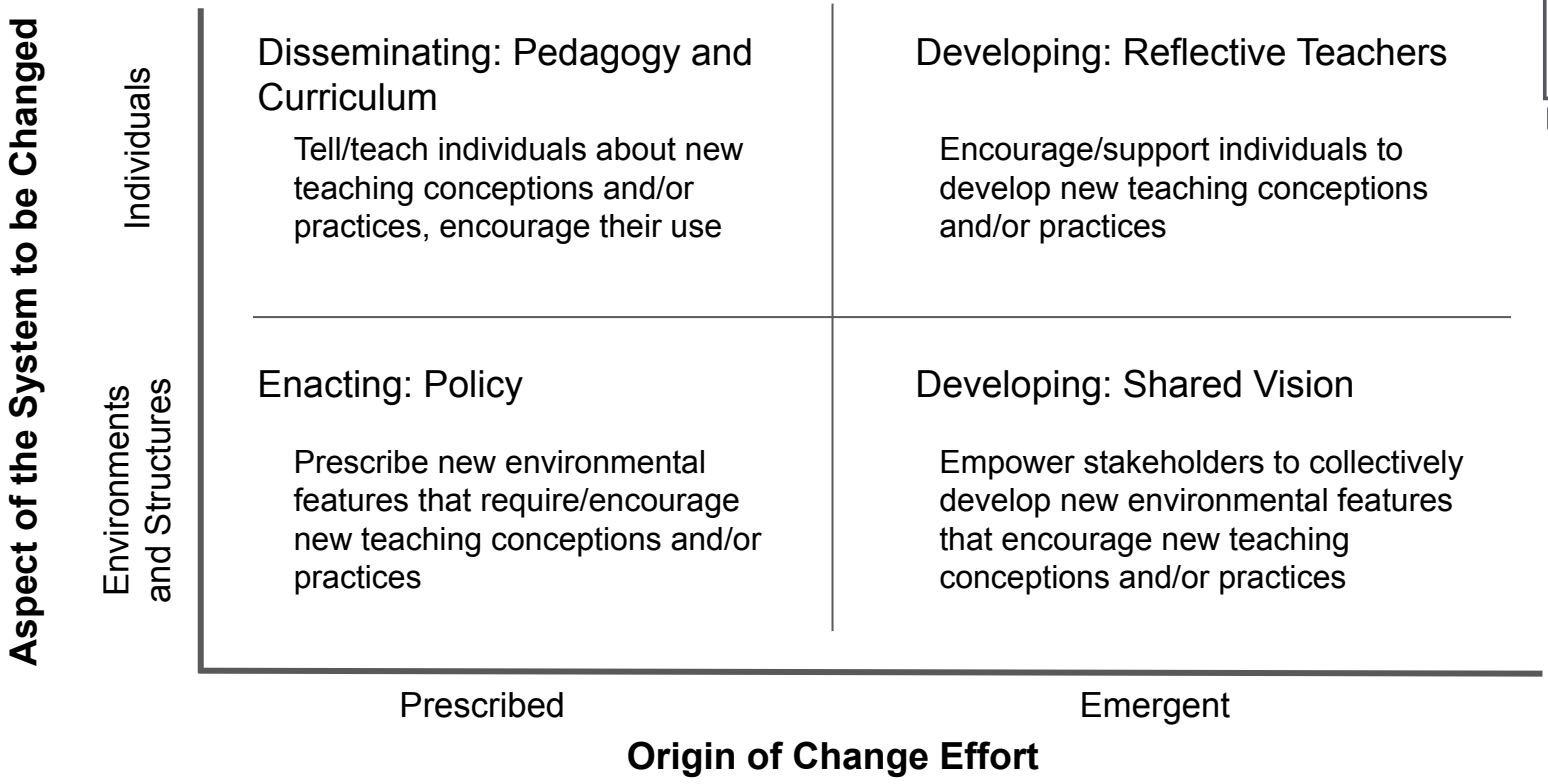






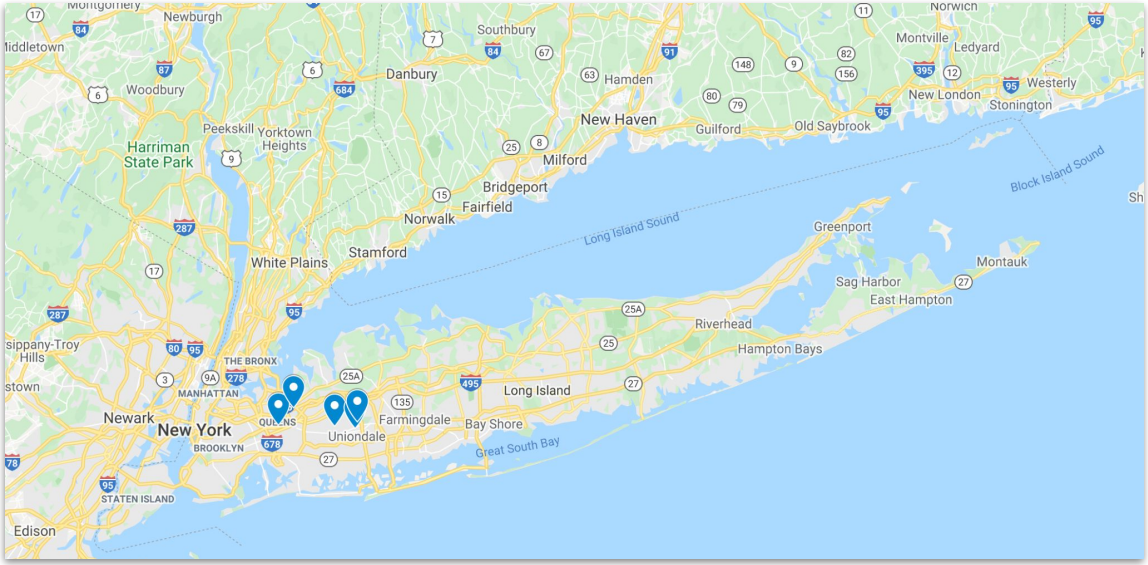
Community of Transformation

Systems Design



STEM² Network

Community of Transformation | **Systems Design** | **Emergent Outcomes**



Adelphi Univ.

Hofstra Univ.

Nassau CC

Queensborough CC

St. John's Univ.

Community of Transformation

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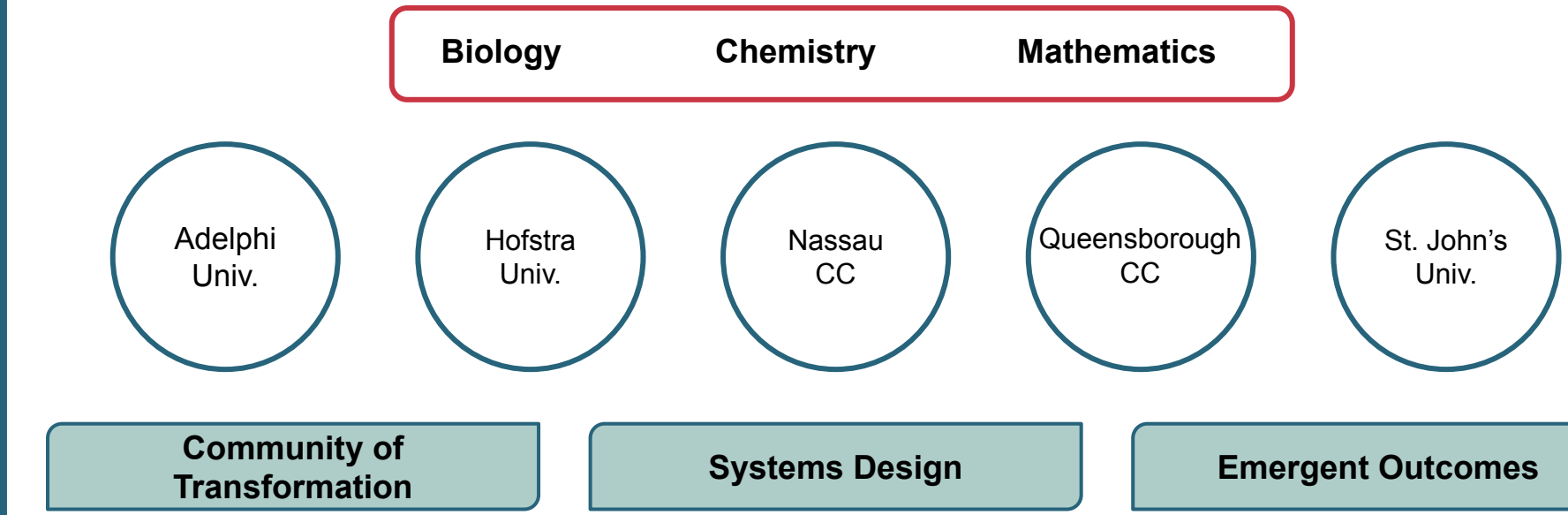
Emergent Outcomes


Biology
Chemistry
Mathematics
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Hofstra Univ.
Nassau CC
Queensborough CC
St. John's Univ.
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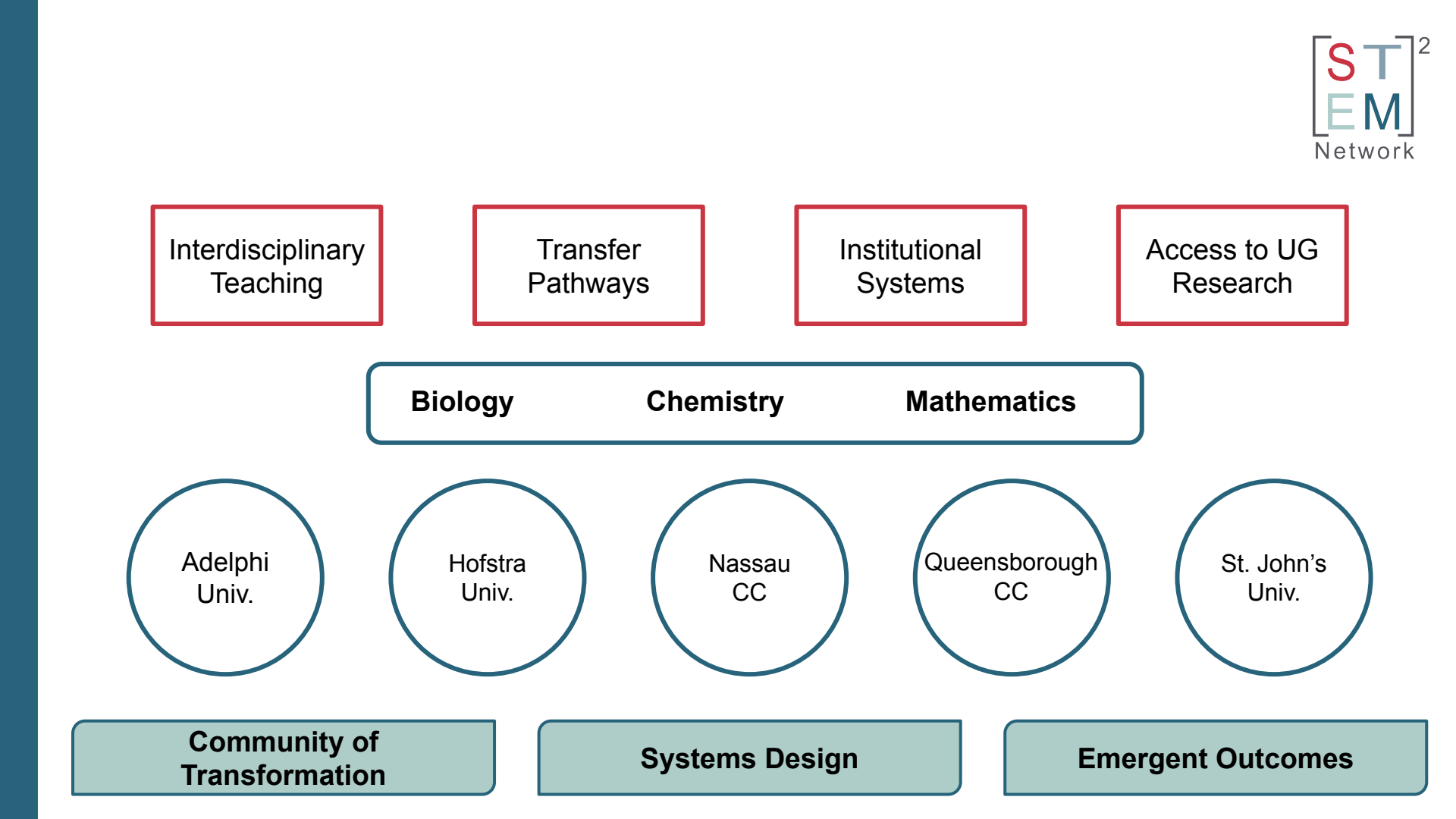
STEM2 Network
Interdisciplinary Teaching
Transfer Pathways
Institutional Systems
Access to UG Research
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Chemistry
Mathematics
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STEM^2 Network

Interdisciplinary Teaching

Transfer Pathways

Institutional Systems

Access to UG Research

Biology **Chemistry** **Mathematics**

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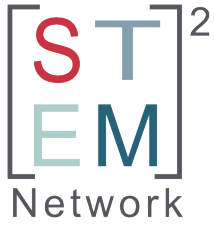

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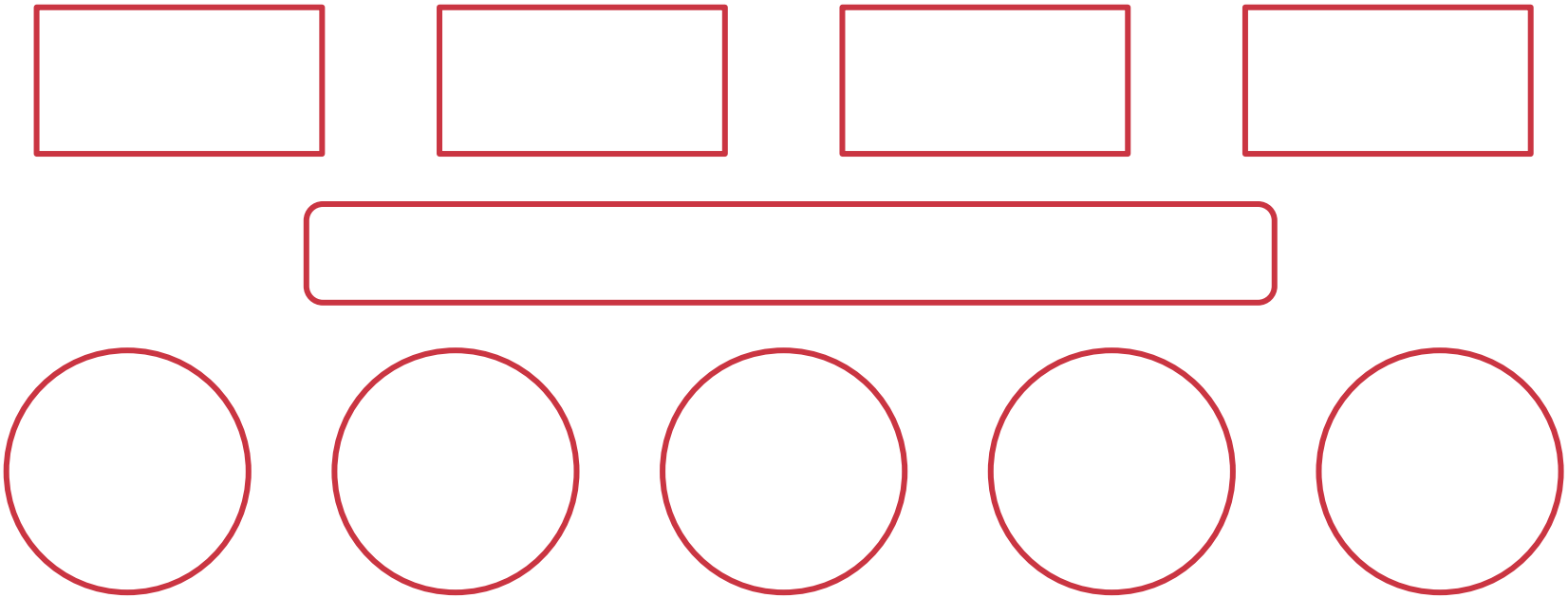

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Products

International of Journal of STEM Education: $(STEM)^2$ Network description

Journal of Microbiology and Biology Education: Lab triage paper

NSF S-STEM Proposal: Nassau CC-Hofstra U

NSF RCN-UBE: Full proposal

Outcomes

Increased cross-disciplinary collaborations

Increased cross-institution collaborations

Stronger ties between 2 and 4 year schools

Increased the extent to which participants feel empowered to be change agents for STEM transformation

What sustains continued participation

Professional development and potential publications

Having the chance to collaborate

Excellent continuing interaction with peers at neighboring institutions working toward helping STEM students in a more coordinated fashion

Contributes to professional growth

...helped me evolve as a teacher and mentor of undergraduate STEM students.

Spurs thinking of new ways to look at old, systemic problems.

My skill set in modeling has definitely expanded, and I feel like I have collaborative contacts at multiple institutions in my local area.

Network Leadership Team and Participants

PI Team
Lawrence Hobbie - Adelphi University
Alison Hyslop - St. John's University
Jacqueline Lee - Nassau CC
Michael Pullin - Queensborough CC
Jessica Santangelo - Hofstra University
Eugenia Villa-Cuesta - Adelphi University

Educational Researchers
Emily Kang - Adelphi University
Heather Mann - St. John's University

System Design Consultants
Emily Gates - Boston College
Clara Shim - Boston College

2020 Participants
Tim Sonbuchner, Chemistry, Adelphi
Emily Mundorff, Chemistry, Hofstra
Steve Raciti, Biology, Hofstra
Sabrina Sobel, Chemistry, Hofstra
Mike Dores, Biology, Hofstra
Gillian Elston, Math, Hofstra
Peter Novick, Biology, Queensborough CC
Sujun Wei, Chemistry, Queensborough CC
Kevin Kolack, Chemistry, Queensborough CC
Alexander Katz, Math, St. John's
Yan Zhu, Biology, St. John's
Florin Catrina, Math, St. John's
Jiyun Kim, Biology, St. John's
Richard Rosso, Chemistry, St. John's
Frank Vazquez, Chemistry, St. John's

Workshop
June 18, 2021 12-1:30pm and 2:30-4pm EDT

Implementing a Systems Design Approach to Institutional Transformation

- Describe the process of systems design for organizational change
- Utilize rich pictures to engage colleagues in discussions
- Identify leverage points for institutional transformation
- Approach change efforts with an eye towards underlying mental models
- Use logic models to align change efforts with inputs and outcomes

Questions?