Conducting PDSAs in the First2 Network

Problem: Although WV students indicate greater than average interest in STEM Careers, over half of STEM majors do not complete a degree in STEM. 70% for first generation students!

First2Network: Formed to do battle on this issue. Target: FGCS up through first 2 years of college.

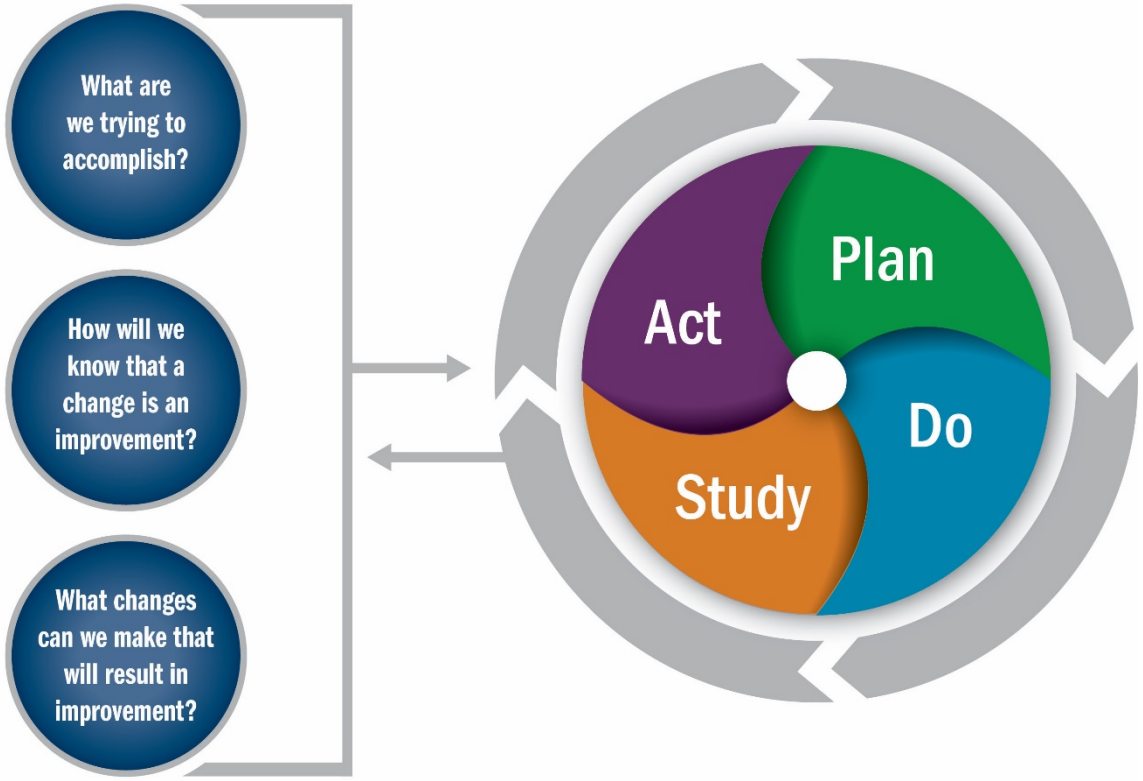
Aim: Double number of students who graduate with STEM degrees

How do we get there?

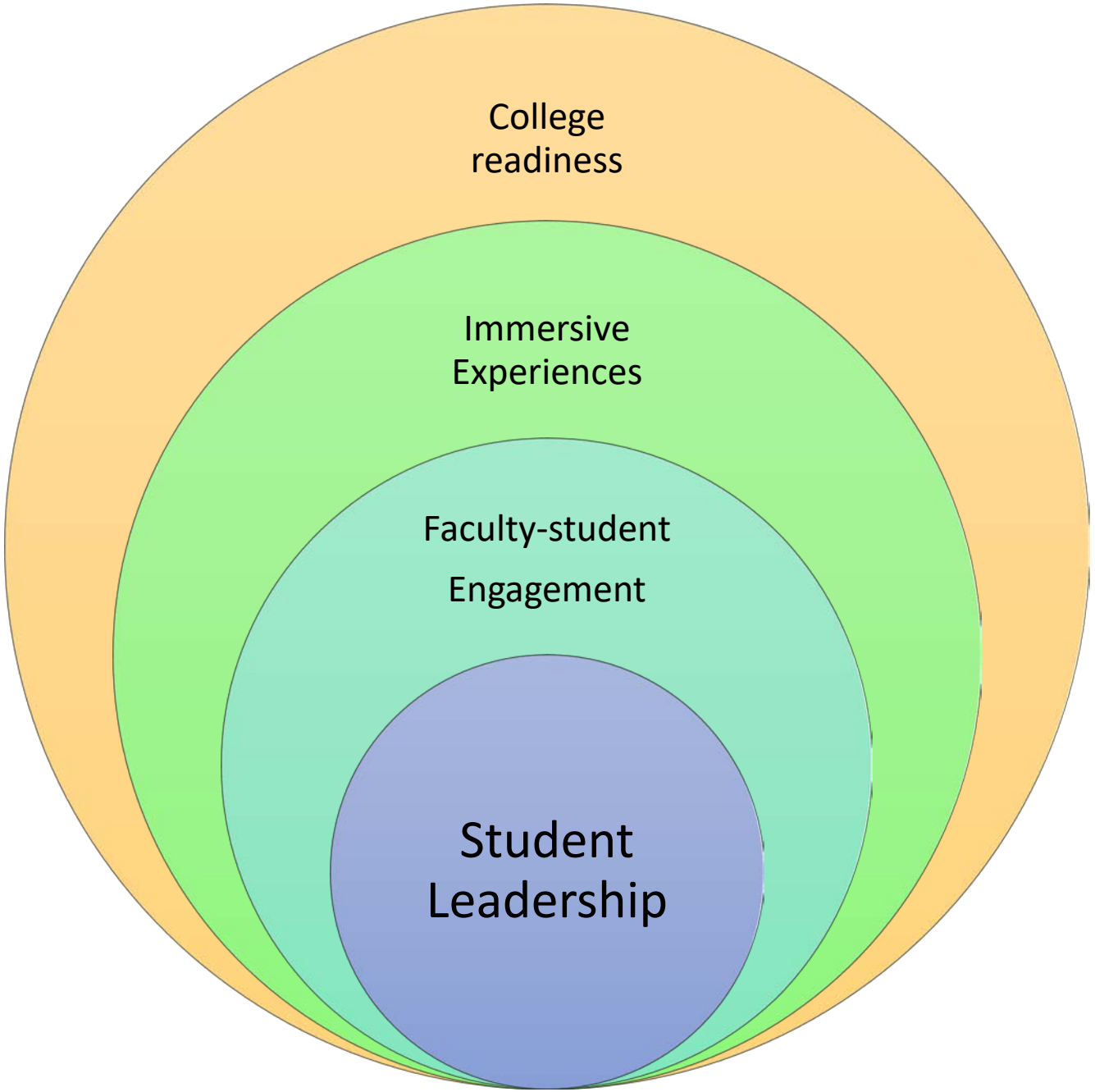
First2 Network is a networked improvement community: a group of stakeholders from diverse backgrounds solving problems together through cycles of Plan-Do-Study-Act. The cycle consists of four stages:

The cycle consists of four stages:

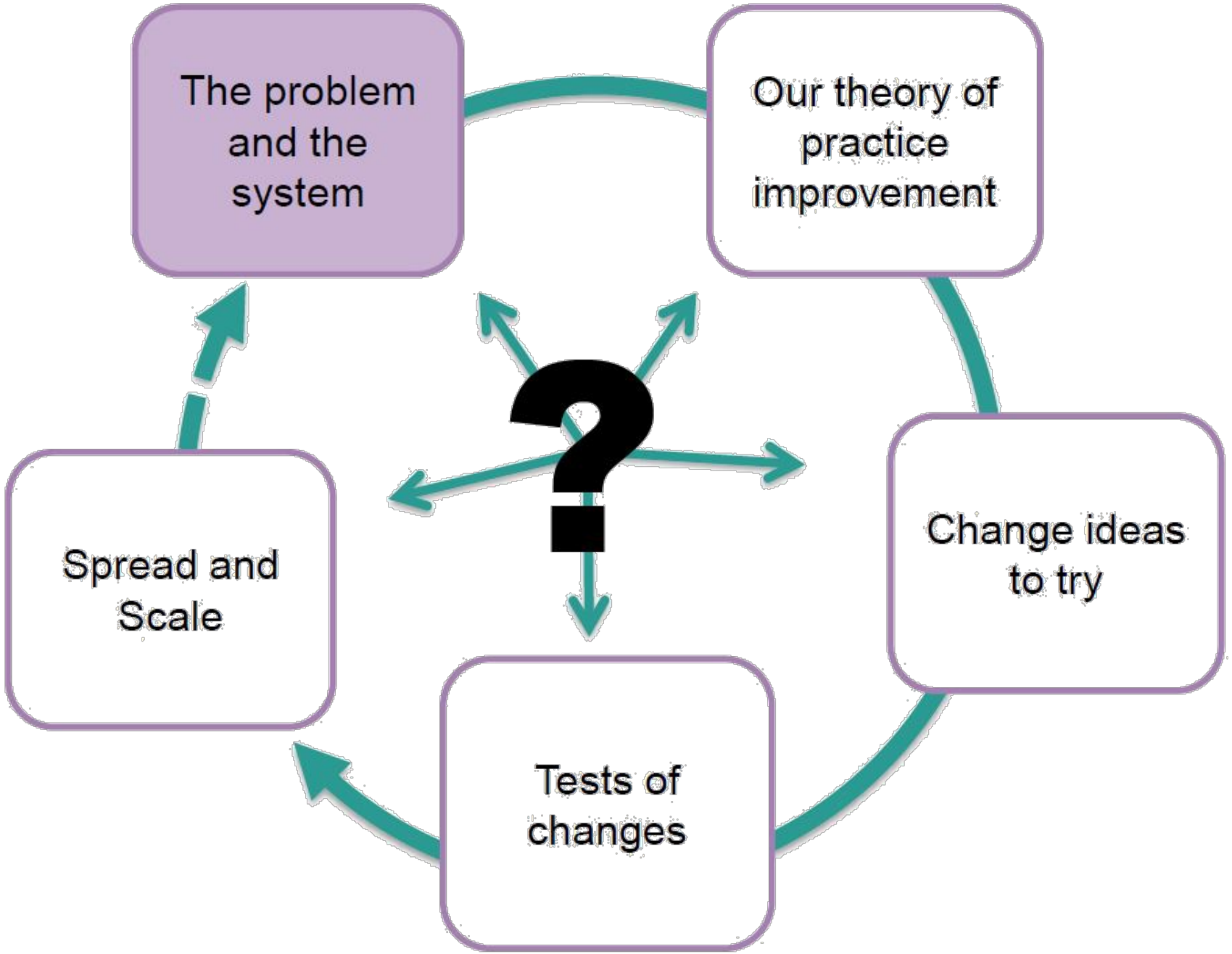
1. Identify specific areas of need (Plan).
2. Intervene to improve supports to address those needs (Do).
3. Measure any changes that occur (Study).
4. Refine the intervention (Act).



Many members conduct PDSAs on these areas as part of a working group:



NICs share and scale successful PDSAs



Why do STEM interested students abandon STEM majors?

Poor Math Preparation

Imposter Syndrome

Scientific Writing

Time Management

Unwelcoming STEM culture in college

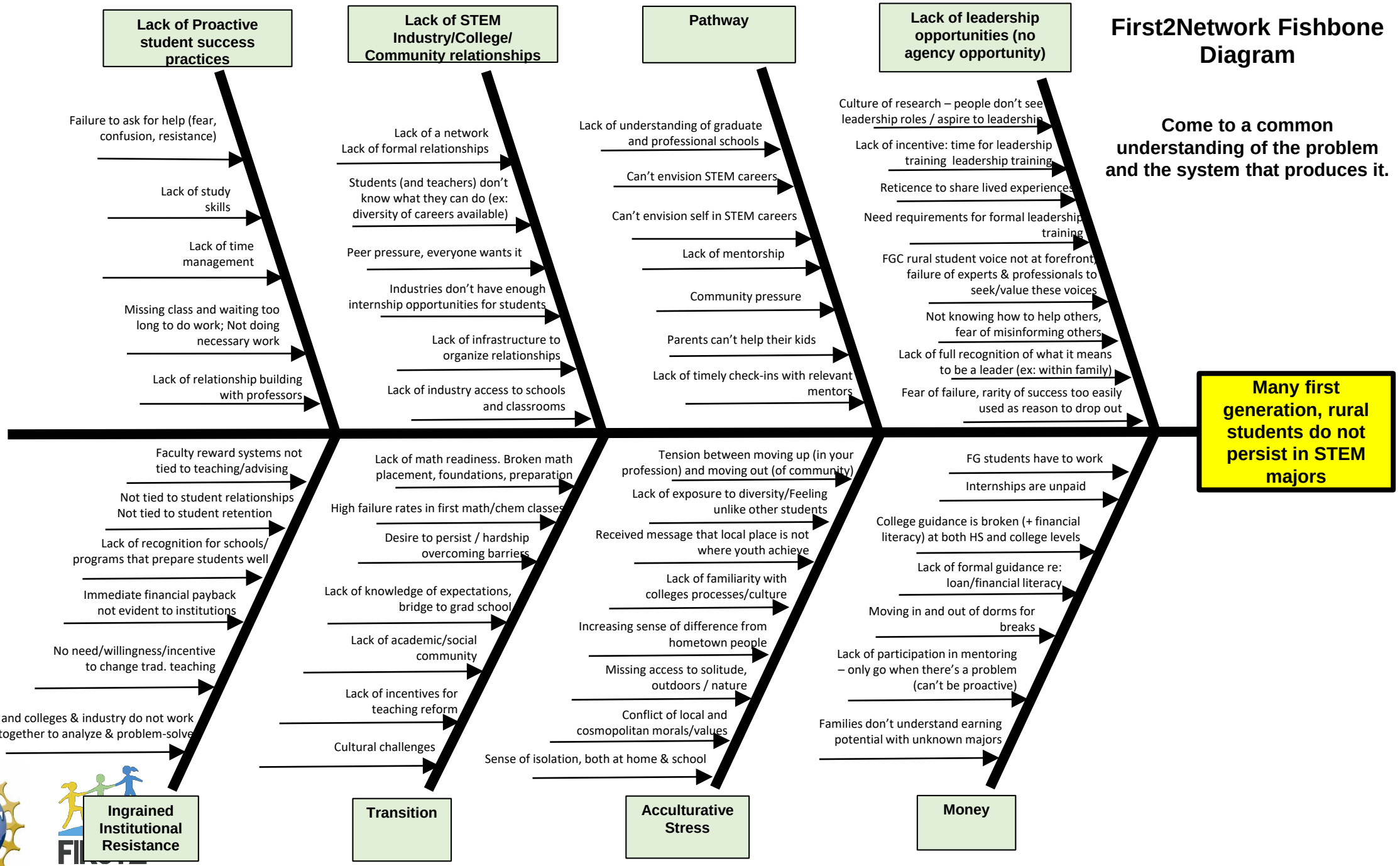
It’s so different from high school science

Overconfidence going in

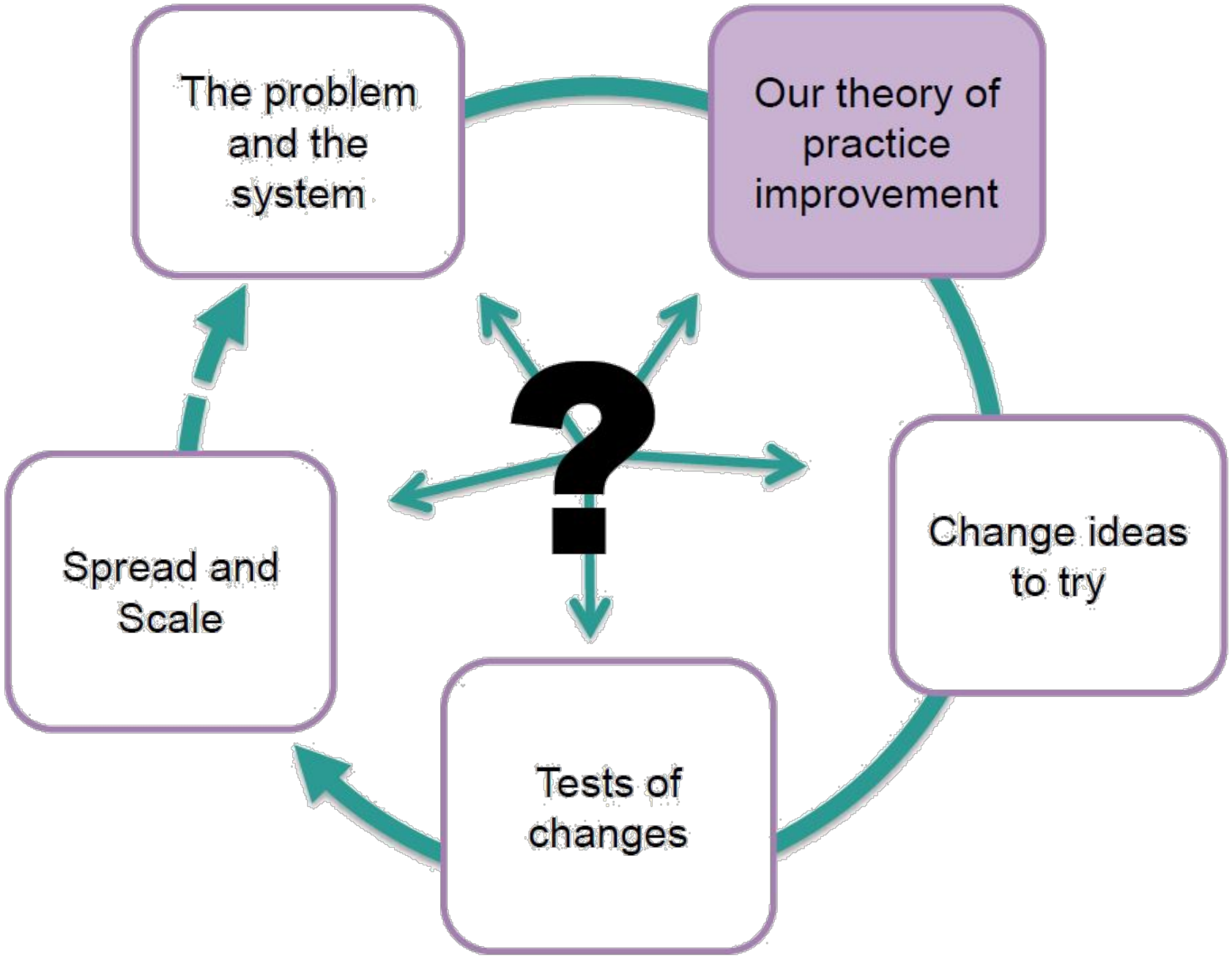
How to recover from failure

First2Network Fishbone Diagram

Come to a common understanding of the problem and the system that produces it.



NIC


The problem and the system
Our theory of practice improvement
Change ideas to try
Tests of changes
Spread and Scale
?

FIRST2 DRIVER DIAGRAM 4/2020

Over the next 10 years, double the graduation rate (from 30% to 60%) of the students in West Virginia who enter college with a declared STEM major who complete a STEM degree within 4 years. Measures

Primary Drivers

Engagement with Undergraduate Institutions: RFG STEM students are meaningfully connected within their undergraduate institutions (faculty, staff and campus) in ways that support retention and success

Engagement with Science Process and Community: RFG STEM students engage in immersive research experiences to develop a sense of belonging and competence in a STEM research community of practice.

Readiness for College: RFG STEM students enter college with requisite knowledge, skills and disposition to succeed.

Engagement in Leadership: RFG STEM students engage in leadership opportunities that identify issues impeding students' to success in STEM, help create solutions to these issues, and increase the reach of the network.

Secondary Drivers

- STEM course Policies and Practices
- social STEM community engagement
- Faculty Awareness and Professional Development
- early research
- Mentoring relationships
- Peer-to peer academic support
- math preparation
- family engagement
- counseling
- stronger situational awareness between workplace-academia
- public outreach

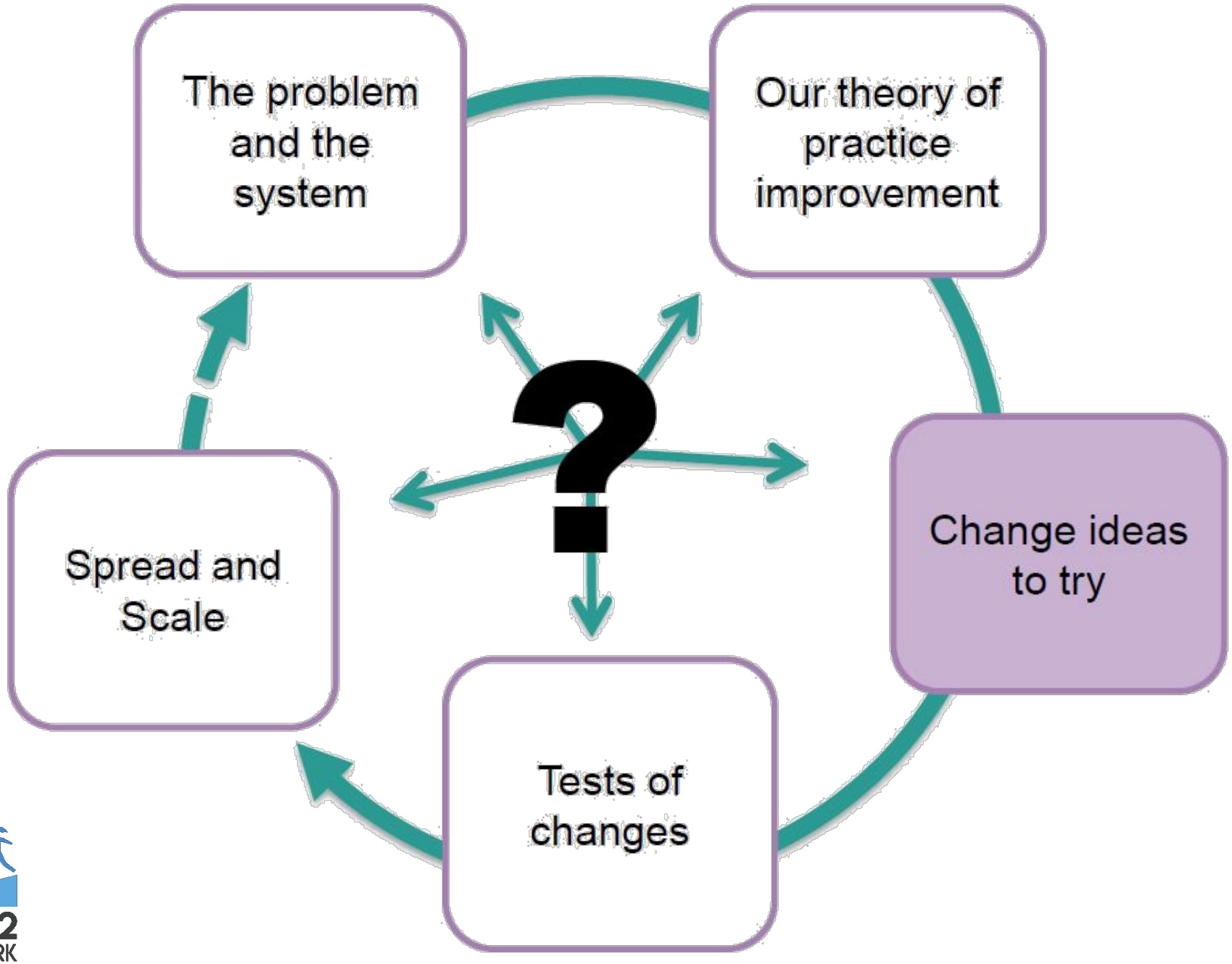
Change Idea Examples

- Faculty discuss actionable classroom obstacles in monthly Personnale and Friends lunch
- Apply metacognition strategies in class
- Promote Office hours interactions
- Exam interventions
- Students create and lead campus clubs
- Awareness of K-12 teacher influence
- HSTA students train 4-hExtension agents on HSTA community research
- F2 Ambassadors discuss STEM with high school and middle school students
- Develop student communication skills
- Build relationships with state legislators

NSF

FIRST2 NETWORK

NIC


The problem and the system
Our theory of practice improvement
Change ideas to try
Tests of changes
Spread and Scale
?

Plan-Do-Study Act

- **Plan** to test a change idea
- **Do** the test, and collect data- **easy measurement**
- **Study** the result
- **Act**: keep change idea, modify and try again, or abandon.
- If keep– how will this idea work in different settings? Another classroom, a different school?
- **Quick cycles!**

Documenting PDSAs on NILS