First2 Network Coaching Handbook

Dear First2 Network Improvement Science Coach,

Welcome to the First2 Improvement Science Team!

Improvement science is a disciplined approach to testing ideas that can lead to systems change. The First2 Network uses improvement science to test high-impact practices — "change ideas" — that improve retention of first-generation, rural and low-income college students in STEM fields. First2 has developed a theory of change that identifies four primary drivers of success for these students: Academics, Belonging/Fit, Connection to Careers, and Leadership.

Institutional teams within the First2 Network plan, conduct, study and act on change ideas using a Plan Do Study Act (PDSA) cycle, then share their findings throughout the First2 "Networked Improvement Community" (NIC). First2 Network has an Improvement Science Team that has developed this handbook and a tool kit for our work in improvement science:
📄 First2 Network Improvement Science Tool Kit.pdf

First2 Improvement Science Coaches are essential to our improvement science process, helping institutional teams meet the standards and goals of First2 Network. Please use the resources in this document to learn about coaching improvement science work and planning for coaching sessions.

If you have questions or concerns you can always reach out to First2 Network at first2.measurement@gmail.com .

Thank you for the great work you are doing and your dedication to the First2 Network.

With gratitude,
The First2 Network Improvement Science Team

FIRST2 NETWORK COACHING HANDBOOK

First2 Network Improvement Science and Coaching Norms

COACHING BEST PRACTICES

Pre-Coaching Review of PDSA

- Familiarize yourself with the [First2 Coaching Checklist](#) and refer to that document prior to coaching).
- Find PDSA document link in 📗 PDSA Status Tracker and ensure that the status matches your understanding. If it doesn't, contact [first2.measurement@gmail.com](#)).
- Review existing PDSA document or description from the coaching request submitted on the [PDSA Ticket System form](#) (output from this form is also available on the "Tester Requests" tab of the PDSA Status Tracker).
- Review similar PDSAs if available, such as prior PDSA cycles with the same change idea from the same institutional team or other institutional teams located in our [PDSA tracker](#).
- Check whether the PDSA is recorded on the most recent versions of First2 PDSA templates ([found in this "Finalized Templates" folder](#)). The footer should show the latest revision data. If drafted on an older template, coach should create a new document on the correct template or update the existing document to conform to the current standard template(s), whichever is better for the tester.
- Is the IRB status recorded? (Has IRB application been submitted, IRB application approved, IRB application and approval been shared with [First2.measurement@gmail.com](#)). You can check recent IRB submissions on the [IRB submissions tab of the PDSA Status Tracker](#). See 📄 IRB Guidance FAQ
- Ask yourself: Does the PDSA show:
  - Overall focus on both big ideas and details.
  - Alignment with [First2 Drivers](#)
  - Change idea description that states learning objectives
  - Learning questions include process and outcome measures
  - Learning questions address at least one of the [required outcome](#) measures, and we strongly encourage use of one from each column:

Academic Progress Measures	Affective Constructs

Persistence/reenrollment	Belongingness
Course completion rate	Grit
Course pass rate and/or grades and/or probationary status	Self-efficacy

- ○ Additional optional outcomes appropriate to the change ideas include:
  - ■ Leadership
  - ■ Mindfulness
  - ■ Self-compassion
  - ■ Other outcomes identified by institutional team
- ○ Predictions for each learning question, following language of learning questions
- ○ Surveys and other metrics
  - ■ Will survey questions and other metrics answer the learning questions?
  - ■ Are Priority common questions included whenever possible?
  - ■ Leadership and other non-priority questions relating to the change idea
  - ■ Identifiable student information for future administrative data pulls (must be collected in Qualtrics and shared only with the institutional team rep)
- ● Request review and comment by other coaches, during Improvement Science Team meetings or asynchronously
  - ○ With good pre-coaching review, it is possible to ask teams to add to their plan before coaching. It is always good to get to a finalized state at the conclusion of coaching if possible. EG : Plan approved.

Plan Coaching

- ● Positivity sandwich: open with positive highlights, use constructive critiques, and end with statements of good work. Use when appropriate, but the goal is to be direct and constructive.
  - ○ Emphasize to the team the good work they are doing for the network and reinforce the potential for systems change from this PDSA and its scaling.
- ● Confirm your (coach) understanding of the overall purpose of the PDSA and the key components of the change idea
  - ○ Summarize your general understanding of the PDSA cycle and change idea, asking the PDSA Tester to clarify any misunderstandings you might have

- - Alternatively, ask the PDSA Tester (person implementing the PDSA) to summarize the key points (e.g., drivers, change ideas, learning questions, outcomes, etc.).
    - Has the Tester referenced other similar PDSAs that were used to develop the current change idea? If so, can they link them in the change idea description?
- Talk through the PDSA document section by section, usually in the order the document is organized.
    - If drafted on an older template, mention using updated templates (and [where to find them](#)), and alert "Tester" if coach has made edits to the doc they submitted.
- Spend as much time as necessary to talk through the **Change Idea** Description section and the **Learning Questions** section.
    - All other sections of the PDSA document flow from these two sections, so getting these two sections correct is critical to ensuring high-quality PDSA work.
    - Does the change idea include sufficient detail: who, what, when, where, how and, most important, why)?
    - Does the change idea fit the stated **Drivers**?
    - Do learning questions include process and outcome measures?
    - Do learning questions address at least one of the [required outcome measures](#)? (We strongly encourage use of one from each column.):

Academic Progress Measures	Affective Constructs
Persistence/reenrollment	Belongingness
Course completion rate	Grit
Course pass rate and/or grades and/or probationary status	Self-efficacy

    - Consider possible additional outcome measures appropriate for change ideas

- **Predictions**: Make sure these are specific and match the Learning Questions.
- Walk through details of **Logistics of Implementation**.
    - Details of target audience, recruitment, outreach
    - Prioritize actions and determine who is responsible for what
    - Confirm all First2 members participating/carrying out the activities for this PDSA
    - Timeline for each step of implementation
- Discuss plan for **Data Collection**.
    - Reminder to work with your team's IRB liaison to obtain approval from Institution's IRB.

- What kinds of data will be collected? (surveys, academic records, attendance)
- How will data collection occur: who will collect data, from whom, and at what point in time?
  - When data on persistence and DFW rates are planned, counsel teams to finish PDSAs sooner rather than later, even if they also want to do longer-term data collection for themselves. A common example is Bridge programs which are started in the fall and it is better for teams to collect data at the end of fall semester than wait til the following spring.
- Will data answer the learning questions?
- Determine survey questions. Refer to First2 Surveys list to encourage use of existing common surveys, and help the team hone in on a specific survey that is as close as possible to what they need rather than requesting a new campus-specific survey.
  - NOTE: If teams desire, common surveys can be edited centrally to include campus-specific questions using Qualtrics display logic.
- Survey timeline should be established (e.g. distribution, completion, and summary)
  - What are your plans to maximize survey response?
    - Coach can share examples of collecting data during the event itself. (e.g., example from Fairmont SciTech to show how to improve response using QR codes in lunch line BEFORE food, pre surveys during class time, etc.).
    - Sending email reminders after an event is not as effective.
- Are surveys linked and/or questions listed in the PDSA document?
  - Are the Priority common questions included?
- What are your plans for studying data with your institutional team?
  - Remember that First2 students are part of each institutional team.
- Address the larger impact of the PDSA in our learning community.
  - Address what system changes could result from this PDSA.
  - Consider scaling potential (how many students in this institution could be impacted over time, how many institutions could replicate this PDSA).
  - Consider iterability (is this a one-off or is this intended to be repeated multiple times?).
- Establish timeline for conducting and completing the entire PDSA (to help Improvement Science Team know when to check in with the team).
- Ask about sharing and ownership of PDSA documents. First2 Network needs to retain copies that can't disappear (and link those in the Tracker).
  - Options:

- - - Institutional teams can transfer ownership to First2Network@gmail.com and keep edit access for all.
      - 📄 How To Transfer Ownership of Google Files
    - Institutional teams who want to retain ownership can create a duplicate and transfer ownership to First2 Network.
- End on a positive note. (*Examples*: Thank you for the great work you are doing for the First2 Network; it is great to see your team coming together on "this" project; this idea has a lot of potential for systems change and scalability).
  - Mention again some specific high points of the plan.
- Complete your coaching update using the [PDSA Ticket form](#)

Coaching for Final PDSA Approval

- Do Section Coaching
  - Institutional Team may draft/complete this themselves and/or request assistance from the Improvement Science Team before drafting.
  - Check to see how closely the implementation plan matches what occurred.
  - During coaching, thoroughly explore and understand the data collection:
    - Were data collected as planned? If not, why not?
    - Can the learning questions be adequately answered with the data collected?
    - Can the data still be collected if needed? If so, create an action plan for getting the needed data prior to final approval.
  - Ensure there are links to deidentified survey data collected by the Institutional Teams.

- Study-Act Coaching
  - Was the full Institutional Team involved in the "Study" activity? Were student team members included? It's important to have a larger team consider this.
    - Who was involved in the review?
    - Were any key people missing from the review?
    - Optional data review with Improvement Science Team.
  - Ask questions that probe what the team thought about the data during their discussion.

- ○ Check that all learning questions were answered and predictions were assessed with specific references to data.
  - ■ If some learning questions cannot be answered and/or some predictions cannot be assessed due to missing data, have the PDSA Tester explicitly document which cannot be answered/assessed and why.
- ○ How was the ACT decision determined?
  - ■ Was scalability considered in the decision, either within this institution or with other network institutions?
- ○ Check that the Act decision and next steps are aligned to the Study section.
  - ■ For example, there is a lack of alignment when deciding to ADOPT a change idea because it was successful, when the Study section indicates missing data prevented understanding whether students benefited from the change idea.

Documenting Coaching Actions

- After each coaching session, the coach completes a coaching update using the [PDSA Ticket System](#), reporting:
  - ○ The section which the coaching session addressed (i.e., Plan, Do, Study, Act, or a completed PDSA).
  - ○ Name **and** link to PDSA.
  - ○ Name and contact email for Lead Tester.
  - ○ What was discussed (data, outcomes, etc.)
  - ○ Whether the coaching session resulted in approval or pending revisions
- When needed revisions are recommended during coaching but could not be completed during the coaching session:
  - ○ **NOTE**: This can follow coaching of a Plan section or of a PDSA submitted for final approval.
  - ○ Coach requests that the PDSA tester and/or institutional team make the recommended revisions to the document, then resubmit a coaching request. The PDSA Ticket System form allows for coaches to set reminder "nudges" to facilitate timely followup.
  - ○ Upon receiving the follow-up request, coach (with assistance from Improvement Science Team as needed) reviews the revisions and ensures that the Plan section or Do-Study-Act sections are now complete and ready for approval.
  - ○ Coach then submits the coaching update to indicate that the Plan or completed PDSA is now approved.

- PDSA tracker will automatically be updated to show approval.

ONBOARDING OF NEW COACHES

All coaches will be required to complete coaching orientation/onboarding to ensure the consistency of our standards. Continued attendance at Improvement Science Team meetings (or participation via review of minutes) is required to stay abreast of changes that are made.

Sequence of coaching apprenticeship:
- Attend 2 or 3 Improvement Science Team meetings.
- Read our https://first2network.org/improvement-science-resources/ page at First2Network.org to understand more about the improvement science process and how First2 acts as a learning community. (Requires login to your First2 member account.)
- Review the First2 Coaching Handbook with experienced coach(es).
- Engage in a coaching apprenticeship with an experienced coach, involving 4 sessions
    - For the first two shadowing sessions, the existing coach is the head coach and the new one is the shadow.
        - Shadowing involves:
            - participating in a pre-coaching planning meeting (can be part of an Improvement Science Team meeting)
            - shadowing during a coaching session
            - and a debriefing meeting afterwards.
    - Session 3 is for co-piloting - new coach is lead and experienced coach is co-pilot. New coach is doing more of the leading and facilitation.
    - Session 4 - new coach leads and experienced coach is there to be available.

General

- Institutional Teams carry out Plan-Do-Study-Act tests of change ideas (PDSAs).
    - Institutional Teams are composed of the participating faculty, staff, administrators and funded First2 student leaders at each institution.
    - Although a PDSA tester(s) is identified, the whole team "owns" the PDSA and should be vested in it and participate in the Study and Act phases.
    - Institutional teams may request coaching assistance at any time - from initially developing an idea into a Plan, to helping with data analysis.
    - PDSAs should identify all actors involved in conducting each step of the PDSA, including both implementation steps and data collection steps.
    - Coaches help reinforce to PDSA testers that the STUDY section is ideally done by the full Institutional Team, instructed by the PDSA Tester(s).
    - All funded First2 students at an institution are part of their institutional teams.
- Benefits for testers
    - When the PDSA Tester(s) is a faculty member, they may need encouragement to take on the process. Here are some ways you can help remind them…

        - …that this work can benefit their academic career more widely, as PDSA work can lead to conference presentations and publications.

        - …that your PDSA is part of First2 Network, a Networked Improvement Community. There are teams from nine higher ed institutions, doing a variety of PDSAs and sharing what works and what doesn't to improve retention and help students be more successful.

        - …that this is a low barrier, low cost way to get involved in educational research by documenting things you are already doing - which means the cost is lower than something entirely new.

        - …that your PDSA becomes a change idea that others in the network can see and could be interested in trying. Documenting the details of your change idea test makes it easier for teams at other institutions to replicate or adapt your work in their context.

        - …that the PDSA document aligns with the First2 theory of change and contains enough information for others to follow what you did. This is how we accelerate change!

- ■ …that using the PDSA format can be a bit of a pain in the beginning, but becomes quicker with time and goes much faster with a real-time coaching session where we usually edit in session and then you're done.

- ■ …that using the PDSA format helps students understand the process for testing ideas, and provides good professional development.

- ■ …that testing change work fits well in several parts of faculty portfolios and administrators have recognized its value at our First2 conferences and administrator workshops: 📄 First2 in Faculty Portfolios - Examples

- The term "First2 students" in the Driver Diagram refers to ALL rural, first-gen and other underrepresented STEM students at an institution, not just funded First2 student leaders.

Eligibility for Approval of PDSA Plan by Improvement Science Team

(See Improvement Science Team (IST) minutes 5/15/2023 and 5/22/2023 for context.)

1. Everything on the First2 Coaching Checklist is checked off.
2. Coaches have some latitude to approve change ideas that address new situations, with consultation with the Improvement Science Team.
3. PDSA must include at least one of the six primary outcomes detailed in the First2 Measurement Examples document), and we strongly encourage at least one Academic Measure.
4. Teams will be encouraged to use Improvement Science Team-approved templates.
5. The change idea must be aligned with the First2 Driver Diagram, but does not require alignment (though encouraged) with existing change ideas.
   a. When a new change idea is proposed by an institutional team, the Improvement Science Team must review and determine whether to accept.
   b. Some change ideas may be encouraged as team activities, even if not meeting the criteria for a PDSA.
6. Teams will be encouraged to use existing common metrics and surveys that measure the six primary outcomes.
   a. Whenever possible, PDSA surveys will include 9 Priority Common Questions that measure belonging, grit, and self-efficacy, in order to assist collection of common data across different change ideas throughout the network.

i. The Priority Common Questions document lists additional optional measures such as leadership, mindfulness, and self-compassion. These and others may be chosen depending on the focus of the PDSA.

   b. Some PDSAs may connect with more than one of the Primary and Secondary Drivers.

7. PDSAs must be intended to be repeated multiple times to ensure they are iteratively improved.

   a. The PDSA must include an intended cadence, but the particular cadence is not specified by Improvement Science Team (e.g. every few weeks, once a semester, once a year are all possible).

8. Teams are encouraged to consider scalability of their change ideas with a goal of reaching a broader sample of First2's target population of first-generation and other under-represented students in STEM.

   a. *Example*: First2 Campus Club PDSA predicts that at least 10% of first-gen first- and second-year STEM majors will attend at least one campus club event each month.

9. Retroactive approval of PDSAs.

   a. Retroactive approval is not a typical or desirable practice, but there have been and could be in the future extenuating circumstances that indicate a need to coach a PDSA related to a change idea that has already been initiated.

   b. The Improvement Science Team could make a retroactive approval in the following circumstances:

      i. Willingness of the institutional team to continue or add to data collection to ensure that one of the six required outcomes is measured.

      ii. Demonstration by team of a good-faith effort to obtain coaching in a timely manner.

      iii. Plan coaching was completed but a revised Plan was not submitted before the Do section was initiated.

      iv. PDSA has high potential for being repeated and scaled, especially at multiple institutions, if some initial data are available after retroactive approval.

Coaches' Communication with Improvement Science Team (IST)

1. Coach assignment and followup.

   a. Institutional teams request coaching assistance using the PDSA Ticket System form.

b. The Improvement Science Team coaches will claim coaching requests in a timely manner and schedule sessions according to availability of PDSA testers and coaches.

c. If PDSA Testers or institutional liaisons reach out directly to coaches for coaching, coaches will refer them to have the lead tester submit a coaching request using the PDSA Ticket System form and/or fill out the coaching request form on behalf of the team.

2. Coaches will complete a coaching update using the PDSA Ticket System form, following each coaching session and after requested revisions are approved. Form entries feed into a sheet in the PDSA Status Tracker.

3. The Improvement Science Team will review the PDSA Status Tracker and discuss PDSA status during its regular meetings.

4. Improvement Science Team will review and discuss PDSAs in progress during its regular weekly meetings.

5. In most cases, coaches are authorized to approve PDSA plans and complete PDSAs on their own, but are encouraged to request assistance from Improvement Science Team to resolve questions about PDSAs that arise during pre-coaching or coaching sessions.

   a. New change ideas proposed by institutional teams.

   b. Requests for retroactive approval

   c. Other PDSA eligibility criteria

6. In the following cases, PDSAs must be discussed by the Improvement Science Team before a PDSA is approved by a coach.

   a. Any new change ideas (not just PDSAs) that in the coach's understanding are not replications or adaptations of existing change ideas that have been tested at least once already.

      i. If using one of the common PDSA templates, it would be unlikely that it would need to be discussed.

      ii. Example: If Fairmont State is doing SciTech social and WVU is doing a social and both are using the common student-faculty social interactions template, Improvement Science Team agrees that those two would not need to be discussed or approved.

HELPFUL LINKS and REFERENCES:

Carnegie Foundation for Improvement of Teaching: carnegiefoundation.org

[First2 Coaching Checklist](#)

📄 IRB Guidance FAQ

[Networked Improvement Community](#)

[Improvement Science Resources at First2 website](#)

[Overview of institutional team structure](#)

[Our PDSA resources/training materials](#)

[PDSA Process](#)

[PDSA Status Tracker](#)

📄 Learning Improvement Strategies 2023

📄 First2 Network Improvement Science Tool Kit.pdf

GLOSSARY

Improvement Science: Improvement science is a problem-solving approach centered on continuous inquiry and learning. Change ideas are tested in rapid cycles, resulting in efficient and useful feedback to inform system improvements.

PDSA: The Plan-Do-Study-Act (PDSA) inquiry cycle is one of the primary tools of improvement science. This cycle serves as a basic learning tool through which practitioners test changes, document the results, and revise their theories about how to achieve their aim.

PDSA template: PDSA templates are set up to make it easier for teams engaging in commonly used or network standard tests of change. The team or coach can make a copy of the PDSA template and name it as a PDSA document for the team to personalize.

PDSA document: Specific tests of change are on PDSA documents, which report on specific PDSA instances.

FAQS/Coaching Practices from Improvement Science Team

1. Campus Clubs doing events that are themselves PDSAs - good practice to link to the separate PDSA(s) inside the Do section of the Campus Club PDSA.
2. Recommend that teams include leadership questions in all the campus club surveys this year as we coach.
3. When the team is creating a PDSA on a change idea that is an iteration of earlier PDSAs, testers may limit the detail, linking to the previous PDSA. They may provide an "example" of an agenda or other detail, noting what has been changed in the current iteration.