

# SPI - Summer 2022 Lesson Plans

## Day 1

### Incubator 1: Goal Setting

June 27, 2022

In this introductory meeting, we will lay the foundation for the institute and the following activities in the fall. Fellows will get to know each other and the facilitators. They will collectively work on setting goals and areas that they want to focus on throughout the SPI.

### Goals

At the end of this session, fellows will be able to

- Meet each other
- Identify goals and develop plans for the institute
- Identify the steps to developing/refining their teaching practices to be more inclusive and employment-focused
- Build toward establishing a shared group agenda/goals

### Agenda

1. Introductions
  - a. Names, pronouns, discipline, and class they're teaching
  - b. hopes = one or two words that describe what brought you to this event or one/two words about what are you hoping to gain by participating (post-it notes, collect them afterward)
2. Setting the tone and discussion guidelines
  - a. Safe to braver spaces: Arao, B., & Clemens, K. (2013). [From safe spaces to brave spaces](#). *The art of effective facilitation: Reflections from social justice educators*, 135-150.
  - b. Ground rules:
    - i. Controversy with civility
    - ii. Own your intentions and your impact
    - iii. Challenge by choice
    - iv. Respect
    - v. No attacks
3. My goals and our goals (Think-Pair-Share)
  - a. Have folks read their application letters and identify and highlight their goals. What goals are in your application?



- b. After everybody is ready, ask them to share it with their neighbors. They can combine the goals if they're aligned.
- c. Ask them what they would like this group to achieve? Keep the goals down to 1-3, concise. What new goals have emerged for you?
- d. Lastly, sharing and brainstorming on a poster board. Identifying shared goals.

## Resources

<https://www.nsf.gov/nsb/sei/edTool/data/college-11.html>

<https://hechingerreport.org/even-as-colleges-pledge-to-improve-share-of-engineering-graduates-who-are-black-declines/>

[https://nces.ed.gov/programs/raceindicators/indicator\\_reg.asp](https://nces.ed.gov/programs/raceindicators/indicator_reg.asp)

<https://www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/>

<https://www.statista.com/statistics/828874/number-of-stem-degrees-awarded-in-the-us-by-race/>

## Incubator 2: End-of-day reflection

June 27, 2022

In the second meeting, we will reflect on the panel discussions and what we can do to improve inclusive and employment-focused practices. We will also talk about the ways we can address students' needs and expectations.

## Goals

At the end of this session, fellows will be able to

- Reflect on the panel discussions, employee perspectives, and students' needs
- Critically examine current instructional practices in STEM classrooms

## Agenda

1. Debriefing the sessions - open space for reflection
  - a. Lessons learned + plan to action (What have you learned? How do we fix it?)
  - b. Reimagining challenges
  - c. Ideas to collectively advocate for change
2. How do we design for inclusion and career readiness?
  - a. Deconstructing what currently is and if we articulated what if
  - b. Divide the board into two: 1) currently, I see ... and 2) What if we ...
  - c. Have fellows think about these two prompts and take a note on a small piece of paper.
  - d. Have them share their notes with their neighbors.
  - e. Sharing with the whole group. Take notes on the board.

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3. So, how do you want to work together to achieve these goals?
4. Reminder/announcements for the following day.
  - a. Bring a copy of the syllabus for your course (if possible).

## Day 2

### Incubator 3: Reflection-Connection-Problematization

June 28, 2022

In this meeting, we will reflect collectively on the morning workshop and answer questions that may arise as a result of the workshop activities. We will critically examine our previous instructional practices that might have connections to pedagogical principles discussed in the workshop. Finally, we will identify ways to incorporate them into our classrooms.

#### Agenda

1. Debrief (e.g., think-pair-share, free write, concept map, google docs, [jamboard](#), or [padlet](#))
  - a. Brainstorm a list of considerations and/or possible tensions in your teaching relative to what's discussed in the workshop. What are the considerations of this that are particular to your teaching context?
  - b. How might you put these perspectives in dialogue with your own teaching?
  - c. What new questions does this workshop raise for you? Theoretically, practically, where do you want to go next?
2. Cohort specific questions
  - a. *Community science*
    - i. How does your teaching consider or reconsider community? What role do communities have in your teaching?
    - ii. How do you envision community-driven inquiry in your classroom?
    - iii. Critically examine two or three aspects of your own practices (if you are carrying out now, if not think about what you need to adjust in your future work/Fall teaching) in light of the community science workshop.
    - iv. How might we intentionally design science programs and learning ecosystems by drawing on the city's natural and sociocultural diversity as strengths that provide support for equitable learning experiences?
  - b. *Computational methods*
    - i. Critical issues while teaching computational methods such as growth mindset, stereotype threat, belonging, and self-efficacy
    - ii. How does your teaching consider or reconsider these critical issues? What role do they have in your teaching?
    - iii. How do you envision the improvement of critical thinking and problem-solving skills in your classroom?



- iv. Critically examine two or three aspects of your own practices (if you are carrying out now, if not think about what you need to adjust in your future work/Fall teaching) in light of the computational methods workshop.
- c. *Early research immersion*
  - d. Possible discussion points: mentor-mentee nexus and belonging in the lab/research site
  - e. How does your teaching consider or reconsider research immersion? What role does your research have in your teaching?
  - f. How do you envision incorporating research in your classroom?
  - g. Critically examine two or three aspects of your own practices (if you are carrying out now, if not think about what you need to adjust in your future work/Fall teaching) in light of the early research immersion workshop.

## Incubator 4: STEM Ed for Social Transformation

June 28, 2022

In this meeting, we will share our vision and dreams for postsecondary STEM education as a tool for social transformation. We will reflect on the panel discussion, and find connections with our teaching practices. Then, we will critically examine a syllabus and how they support engaged student learning.

### Agenda

1. Debrief (e.g., think-pair-share, free write, concept map, google docs, [jamboard](#), or [padlet](#))
  - a. Reflections, comments, questions
2. Questions to ask
  - a. In what ways does this panel influence your own thinking about how you teach and for what purposes?
  - b. Why is inclusive teaching important in higher ed, and in STEM ed in particular?
  - c. What are some connections between race, science, meritocracy, and inequity in science education? What are the considerations of this that are particular to your teaching context?
  - d. Did any of you just search for a scientist? If you were to create the algorithms for the searches of “science” and “scientist” what would you include and why?
    - i. Strong et al. (2017) described the tenets of the critical transdisciplinary approach. What are the tenets of the critical transdisciplinary approach that are most connected to your teaching? How do they apply to your teaching?
3. Syllabus audit (see below for questions you might consider as you complete your audit and share this [checklist](#) if you wish)



- a. Overview
  - i. What system(s) and/or image(s) of knowledge are present in the syllabus/course design/course structure?
  - ii. What system(s) and/or image(s) of knowledge are absent? What approaches to teaching are evident/present in the syllabus/course design/course structure?
- b. Instructional Practices
  - i. What modes of learning are present (i.e., lecture, dialogue, online, group work, service-learning, experiential, self-designed, etc.)?
  - ii. How does diversity, social justice, decolonization, or anti-racism show up in the syllabus?
  - iii. How is student support for learning presented?
- c. Assessment and Evaluation
  - i. What types of assignments, evaluations, or metrics of student learning are presented? What do these assignments and metrics say about the pedagogical or philosophical approach to learning/modes of learning?
  - ii. What does the syllabus say about the evaluation of the teacher?
- d. Student role
  - i. What is the role of students in the course? What responsibilities do students have?
  - ii. Are diverse learners accounted for?
- e. Check all that applies
  - i. The curriculum elevates scientists, mathematicians, engineers, and/or artists with historically marginalized identities (i.e., non-binary or trans people, women, people of color, people with disabilities, working-class people, and multilingual people) and their discoveries.
  - ii. Curriculum highlights and affirms the knowledge systems of Indigenous, Black/African, Brown, and non-western conceptions of science, technology, engineering, arts, and math.
  - iii. The curriculum and instructional activities promote or provoke critical questions about science, technology, engineering, arts, and/or math and the societal status quo.
  - iv. The curriculum presents social situations and problems not as individual problems but as embedded within a societal and/or systemic context.
  - v. The curriculum encourages students to critically examine dominant knowledge systems as scientists, mathematicians, and artists.
  - vi. The authors of the teaching materials are people of diverse identities (race/ethnicity, gender, other identities).
  - vii. The curriculum provides opportunities for students to use accessible technology to explore STEM concepts in ways that reflect a variety of ways of doing.
  - viii. Issues of social justice, equity, and Black, Indigenous, and people of color's experiences and contributions are reflected in homework/classroom assignments and assessments.

- f. What other unique issues or observations do you notice that are worth dissecting?

## Day 3

### Incubator 5: Active Learning isn't enough!

June 29, 2022

During the morning of our final day, SPI fellows participated in a workshop focusing on equity-oriented active learning. They had the chance to review relevant research and examine models. In this incubator, we collectively reflect on incorporating inclusive practices to maintain an engaged learning environment. We develop strategies to plan, implement and assess equitable active pedagogies.

#### Agenda

1. Debrief (e.g., think-pair-share, free write, concept map, google docs, [jamboard](#), or [padlet](#))
  - a. Reflections, comments, questions
  - b. What have you or other instructors you know done in the past (before this institute) to make your classroom or online courses more active/inclusive/evidence-based?
  - c. Describe two changes in your approach to module design and pedagogy (e.g., materials, content, activities, teaching strategies, and assessment) that you will implement to enhance equity.
  - d. Describe two strategies you plan to use to create an equitable and inclusive climate in your course and how will you assess the impact of these strategies?

### Incubator 6: Moving forward

June 29, 2022

In this final meeting, we come together to reflect on the summer institute, discuss our goals for the next semester, and identify strategies to implement those goals.

#### Agenda

1. Debrief (e.g., think-pair-share, free write, concept map, google docs, [jamboard](#), or [padlet](#))
  - a. Reflections, comments, questions
  - b. How has your thinking changed about the role you play in shaping an accessible classroom climate?

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- c. Describe two specific steps that you plan to take to incorporate into your class proactively.
2. Moving forward
  - a. Wouldn't it be fantastic if ... complete the sentence for what you would like to achieve by the end of the fall semester.
  - b. Revisiting the goals from the first day
  - c. Fall semester planning
    - i. Wishes
    - ii. Names to bring
    - iii. Workshop ideas
    - iv. Instructional design support desired
3. Share this [checklist](#) again.