

# Creating Space for Dialogic, Reflective, and Student-Led STEM Learning

## Tools to use

- Question **redesign**
- **Facilitation** practices
- **Rotation** of roles in group work
- Rubric-based **peer reviews**
- **Self-assessment** tools for **bias recognition** and identity reflection
- **Multimodal feedback** (*videos, drawings, anonymous responses*)
- **Discussion protocols** (*Fumble Forward, Think-Pair-Share, Jigsaw, Chalk Talk*)
- Data-driven **dialogues** and **visual mapping**

## Activity: Redesigning a Data Science Discussion

1. **Pre-class journaling:** “How do I see this problem? What biases might I bring?”
2. In-class **small-group** *Fumble Forward* sessions and **rotating leadership** to **encourage all voices**.
3. Use *Concentric Circles* or *Jigsaw* to expose students to **diverse problem-solving lenses**.
4. **Post-class:** *Peer Reviews, Multimodal reflections* (e.g., 90-sec video or anonymous writing).

## Goals

- 1 Redirect **traditional lecture-based, one-way learning** toward a **dialogue-rich, student-centered** classroom.
- 2 Raise **awareness** of **implicit bias** and foster **self-reflection** around **identity** and **positionality**.
- 3 Empower students to become **active participants in their own learning** through **dialogue, vulnerability, and critical engagement**.

## Keywords

*Storytelling, critical reflection, multipartiality, power redistribution, structure and meaningful constructive feedback, bias recognition and identity reflection, inclusion, diversity, equity, vulnerability, personal experiences, identity, connect abstract content with real experiences.*