Imagining the Future of Undergraduate STEM Education

The National Academies of SCIENCES ENGINEERING MEDICINE

NSF

#STEMFuturesHigherEd

Students at the Center

- Authentic, *in situ*, interdisciplinary active open-ended **projects**
- **Autonomy** — students make choices and self-directed decisions
- **Meta-cognitive** — students learn to see/judge their progress
- **Meaningful** — connected to team, community service, purpose
- **Mentoring** — meet students where they are and support/scaffold
- Build **self-efficacy**

passive → active

knowledge → skills

sage → coach

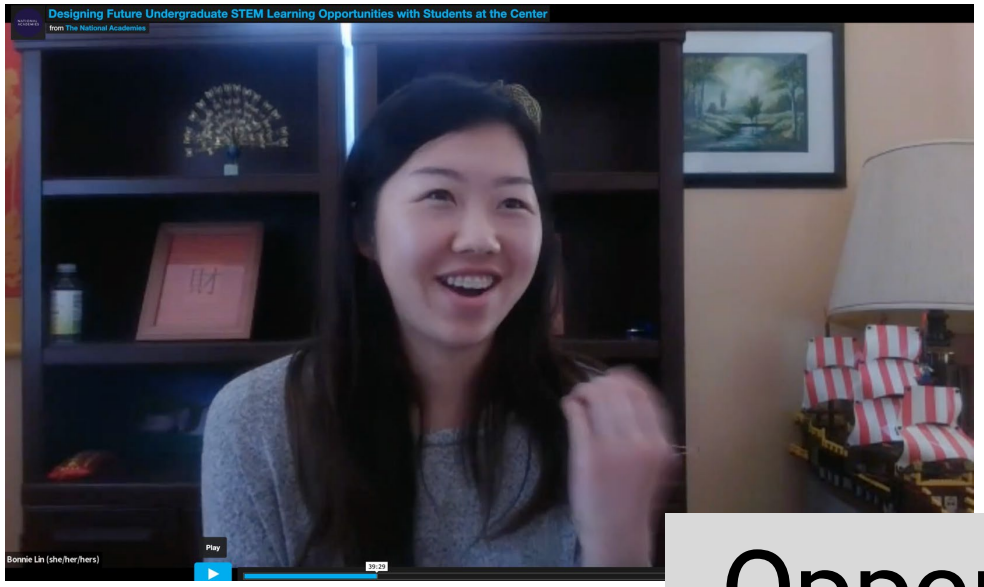
siloed → interdisciplinary

sterile → messy

one answer → process

Challenges

- STEM Faculty culture — overemphasis on content
  and fund of knowledge/how to: experiential pedagogies,
  community engagement,
  invisible curriculum
- Institutional structures — policies, facilities, staffing models, calendar
- Systems & metrics of higher education including accreditation
- Secondary education — drums autonomy out



Opportunities