Investigating Socio-environmental Issues with Data: A Case Study Approach
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☐ Why using case studies to teach socio-environmental synthesis?
☐ What can be gained by teaching with case studies?
☐ What are the challenges? What are the possible solutions for addressing these challenges?

Case Study Pedagogy (in Teaching Socio-Environmental Issues)


Case Study Collections

Climate Change
- CLEAN (Climate Literacy & Energy Awareness Network): [https://cleanet.org/index.html](https://cleanet.org/index.html)
- U.S. Climate Resilience Toolkit: [https://toolkit.climate.gov/case-studies](https://toolkit.climate.gov/case-studies)

Environmental Sciences and Studies
- InTeGrate (Interdisciplinary Teaching about Earth for a Sustainable Future): [https://serc.carleton.edu/integrate/index.html](https://serc.carleton.edu/integrate/index.html)
- Yale School of Forestry & Environmental Studies: [https://environment.yale.edu/academics/case-studies/](https://environment.yale.edu/academics/case-studies/)

STEM, Biology, Ecology, Quantitative Sciences
- American Museum of Natural History: [https://www.amnh.org/explore/curriculum-collections](https://www.amnh.org/explore/curriculum-collections)
- National Center for Case Study Teaching in Science: [http://sciencecases.lib.buffalo.edu/cs/](http://sciencecases.lib.buffalo.edu/cs/)
- QUBES (Quantitative Undergraduate Biology Education and Synthesis): [https://qubeshub.org/qubesresources](https://qubeshub.org/qubesresources)

Law & Policy, Economics, Sustainability
Why using case studies to teach socio-environmental synthesis?

What can be gained by teaching with case studies?

What are the challenges? What are the possible solutions for addressing these challenges?

Case Study Pedagogy:

Including teaching notes that provide background information, learning goals and objectives, guidance on classroom management, suggested assessment questions, and supplementary materials.

Compelling stories are at the heart of the case study method. Often presented as a problem or scenario with characters and dialog, these stories provide context to abstract ideas and concepts and offer a more tangible means for students to understand the relevance of the lessons at hand. They also engage students by personalizing the problem of issue and making it assessible.

The case study method is fundamentally about analyzing problems and issues.

Key skills: critical thinking, team work, problem solving

Key gains include:

1. case studies provide students with a context for understanding the reasons behind the analytical skills taught in class
2. case studies provide students with the opportunity to recognize the social-environmental complexity of real-world cases
3. case studies get students excited about the real-world implications of their analytical work
4. case studies provide students with the opportunity to practice problem-solving and analytical skills, mimicking what the real-world work environment is like
5. case studies serve as a platform for implementing problem-based learning and practicing working in groups.

Common challenges include:

1. how to assess student learning in a quantifiable way
2. suitable for upper-level competencies (synthesis and application), prior knowledge of fundamental analytical skills is a prerequisite
3. student-centered, active learning → students need to be self-motivated. By the end, question what tangible skills the instructor has taught them
4. how to cope with math anxiety and guide students to conduct deeper analysis of socio-environmental data (beyond the most obvious trends)
5. socio-environmental complexity may be too overwhelming
6. how to guide students to see the potential of applying the same analytical skills to other cases (beyond the case in which these skills were taught)
7. how to fairly evaluate individual student’s contribution to group work
8. how to set a boundary of a case and makes the teaching unit self-contained. Socio-environmental issues can contain never-ending complexity. It is impossible to address all levels of detail in a case teaching unit. Must identify clear learning objectives first and make sure that the case chosen and how the case is presented align with the learning objectives. Be mindful of how much time would be allocated to the case teaching (2-4 classes, 4 weeks, semester long? Scaffolding)