Responding to an Emerging Epidemic through Science Education (REESE)

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The COVID-19 pandemic offers an example of why *scientific literacy* is so critical.

We contend that science classrooms should be spaces in which learners explore complex issues, like pandemics, and how science can be used to inform societal solutions and personal decision-making.

However, issues-based teaching is challenging. Science teachers often struggle with the emerging nature of the science, limited curriculum materials, connections between science and social dimensions (Hancock et al., 2019; Smith et al., 2017).
Primary Goals

Collaborate with HS science teachers to create and implement COVID-related curriculum materials.

Study how teachers enact COVID-related materials AND how students respond to associated learning materials in the midst of the pandemic.

Contribution: An up-close examination of how the COVID-19 pandemic is affecting science classrooms, teachers, and students.
Who is involved?

University-based Science Educators

12 Science Teachers

1,032 Students (Data from ~300)
Project overview

Teacher PD & Co-design 1

Teacher PD & Co-design 2

Enactment 1

Enactment 2a

Enactment 2b
Project overview

Curriculum materials that help students:

- Develop science ideas
- Use computational & mathematical models
- Develop media & information literacy skills
- Build systems thinking

https://epiclearning.web.unc.edu/covid/
Data Sources

Teacher PD & Co-design 1

Teacher PD & Co-design 2

Enactment 1

Enactment 2a

Enactment 2b

Teacher Interviews

Instructional Logs

Student Surveys
Key Findings from across the project

a) Teacher level Concerns
• Concern for students’ mental health & potential impacts of instruction related to COVID
  • How might instruction interact with the trauma of the pandemic interact?
  • RESPONSE: Pediatric psychologist worked with group—learning about a trauma-inducing situation can support students’ mental health
• Misalignment between standards (NGSS) and teaching about a pandemic
  • Do we have class time to address COVID?
  • RESPONSE: Highlight student engagement in science practices (modeling)
  • RESPONSE: Position COVID unit as vehicle for teaching characteristics of life
Key Findings from across the project

a) Teacher level Concerns

b) School/District level Challenges

• District policies for curriculum & instruction as country moves to distance learning (spring 2020)
  • District 1: Teachers control curriculum
  • District 2: Teachers control curriculum but student requirements are removed
  • District 3: District controls curriculum
    • Spring 2020- No new content to be introduced
    • Fall 2020- All biology classes across the district to follow same curriculum and pacing
Key Findings from across the project

a) Teacher level Concerns

b) School/District level Challenges

c) Student level Perspectives

• Most students identify reputable sources for their COVID information choices (e.g., CDC, medical professionals) including their Science Teachers
• Students very interested in learning about COVID & the pandemic.
• More interested in pragmatic issues (what are symptoms) than conceptual issues (how viruses reproduce)
• Most students expressed deep concern about the pandemic
  • Health, Family economic situation, Futility of online classes, Anxiety
  • Identify science classes as places to find useful information
Project Takeaways for STEM Educators & Educational Researchers

**Celebrate**: Students look to science teachers and science classes to help them make sense of complex issues.

**Anticipate**: How system constraints & situational factors may impact teacher practices.

**Recognize**: The outsized impact of district policy on innovation, curriculum & research.

Does a Research-Practice-Partnership help?
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