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Project EDDIE: Supporting Teaching Quantitative Reasoning Using Large Data Sets

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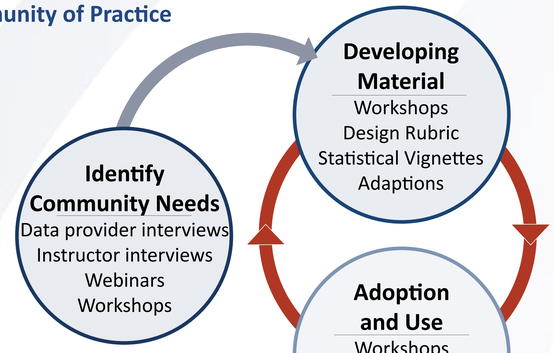
Background

The increasing availability and wealth of large, environmental datasets creates new opportunities to teach scientific concepts and quantitative reasoning with these data. Project EDDIE (Environmental Data-Driven Inquiry and Exploration) is a suite of NSF funded projects focused on developing and expanding a self-sustaining community. The Project EDDIE community is composed of instructors, outreach coordinators, and data providers engaged with materials and professional development designed to foster pedagogical orientation favoring open inquiry with large datasets and teaching quantitative reasoning.

The community will build a shared vision that starts with understanding the best practices and strategies for improving the teaching of quantitative reasoning using data in the classroom and identifying gaps in available resources.

For information, please visit: **projecteddie.org**

Community of Practice



Participants in the June 2019 Teaching Quantitative Reasoning with Data Workshop Details: https://serc.carleton.edu/216011

What is the Community Saying?

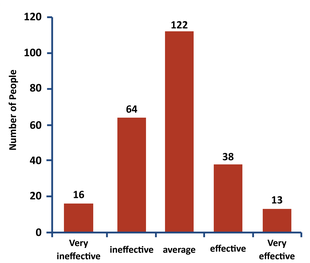
Instructors and data providers identified benefits, strategies, challenges, and needs associated with teaching quantitative reasoning with data.

Outcomes are directly informing the module design, resources, and professional development programming and will continue to inform new opportunities

1) Multiple benefits of teaching with data: quantitative reasoning, student engagement, student skillset, and scientific literacy
   - Informing Professional Development programming, Community growth
2) Effective course structures and strategies include building student confidence, matching student outcomes with evidenced based pedagogy, and building faculty confidence and ability
   - Informing Community Resources, Instructor Adoption Materials, Professional Development programming
3) Challenges to teaching quantitative reasoning include uneven student preparedness, variations in computing platforms, and balancing learning outcomes among quantitative reasoning, data processing, and scientific content
   - Informing Statistical Vignettes, Module Design, and Module Rubric
4) Needs for pedagogical tools and include resources such as scaffolding for instructors, strategies for teaching quantitative reasoning with technology, approaches for evaluating student learning
   - Informing Module Design, Instructor Adoption Materials, Professional Development programming, and Faculty Mentoring Network

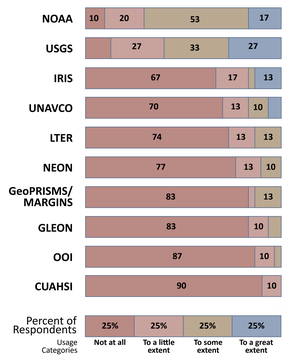
We asked the EDDIE Community:

How effective are you in incorporating large datasets in your teaching?

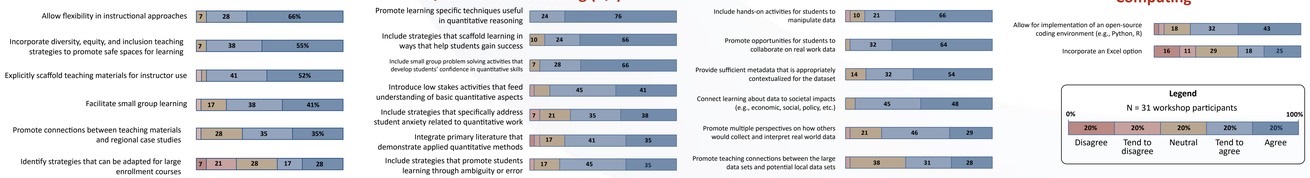


243 people responded to our question and most people identified as being 'average' in their effectiveness in incorporating large datesets in their teaching.

Which of the following data sources do you incorporate into your teaching?



What elements do participants perceive as critical elements of EDDIE modules?



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Illinois State University — Illinois' first public university.

SERC | Science Education Resource Center @ Carleton College

Queens College

The University of Arizona

Resources

Community Sourced Materials

The EDDIE Community that includes members like you, will be the source of ideas and materials to address the communities' identified needs and challenges.

https://serc.carleton.edu/233457

Workshop and Community Contributions

Community contributions related to teaching quantitative reasoning with large datasets from across environmental science related disciplines, institution types, and classroom settings

Workshop Synthesis **Essays**
Course Syllabi **Teaching Activities**

Publicly Available Datasets

Community sourced collection of publicly available data sources that span environmental related disciplines

Webinars

Topics focus around the topics of teaching quantitative reasoning and teaching with large datasets.

Past webinars were recorded and **future webinars** will address:

- Module adaption and adoption of teaching materials for your coarse scenario
- Instructor Professional Development for teaching quantitative reasoning and teaching with data

Past webinar topics

- Developing and Implementing EDDIE Teaching Modules Using High-Frequency Datasets to Address Scientific Concepts and Quantitative Reasoning Skills
- How to Adapt EDDIE Modules to Meet Student's Needs
- Using Time Series Data in the Classroom
- Developing students' quantitative reasoning skills using large authentic datasets

Material Development

New EDDIE Modules

Module development workshops will focus on participants designing flexible EDDIE teaching modules that pair scientific concepts and quantitative reasoning with teaching with data.

Participants will learn about using large datasets to improve quantitative reasoning, develop an EDDIE module, and pilot that module in their course. This first Module Development is October 2019 with a second workshop in summer 2021.

EDDIE modules consist of a Powerpoint, instructor information, student handout, and a copy of the dataset.

https://serc.carleton.edu/eddie/modules.html

Learn more about EDDIE modules at Poster #81

Module Development Rubric

- Module developers will adhere to a **design rubric** that during module design, piloting, and revisions
- The rubric was informed by existing EDDIE modules, community input, and other community-driven rubric models (e.g., InTeGrate, GETSI, GeoPRISMS).

Statistical Vignettes

- Designed to address quantitative concepts as a Just in Time Teaching resource
- Designed to be used independently or in combination with an EDDIE module
- Storylines will be decoupled from a specific module to allow flexibility and include brief lectures and supporting materials
- Topics based on the Community Needs input and the current module design process

Instructor Support

Faculty Mentoring Network (FMN) - Starting Fall 2019

Project EDDIE is partnering with QUBES to bring together faculty interested in implementing existing EDDIE modules to address quantitative reasoning and scientific concepts using large datasets.

QUBES

Program Outline

- Bi-weekly virtual meetings with peer group and mentor
- Adapt existing modules for your specific course
- Author a reflective instructor story about implementing an EDDIE module
- Leave with documented strategies and adoption materials ready for implementation in the classroom

If you are interested in any Project EDDIE Opportunities

Contact US! - https://serc.carleton.edu/217908

Fostering Adoption

The module development process and FMN will include documenting community derived ideas, strategies, and implementation materials

- Instructor Stories
- Instructor adoption on-ramps

Project EDDIE will be recruiting workshop participants at professional conferences (e.g., ESA, ASLO, GSA, AGU, GLEON) starting late 2020

Get Involved

Join the EDDIE Community to keep up with the latest opportunities (webinars, workshops, FMN), new material and project updates

https://serc.carleton.edu/214401

eddie news

Browse Project EDDIE
projecteddie.org