



Project EDDIE: Supporting Teaching Quantitative Reasoning Using Large Data Sets

projecteddied.org

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Background/Introduction

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 an expanding community of instructors able to effectively use and develop materials that prepare students to utilize large datasets and apply their own quantitative analysis of large datasets to support scientific argumentation.

Project EDDIE aims to develop a self-sustaining community of instructors engaged with materials and professional development designed to foster pedagogical orientation favoring open inquiry with large datasets. We will focus on topics related to the environmental and Earth sciences, allowing the greatest potential for adoption across a wide range of STEM courses, from physical to life sciences.

This poster outlines the EDDIE community and the professional development opportunities to help the community grow and contribute to the creation of EDDIE modules and teaching resources centered around teaching quantitative reasoning with data. For information, please visit: projecteddied.org

Identify Community Needs

We are using feedback from the broader community to help determine challenges of using large datasets in the classroom to facilitate module adoption.

1) Interviews with instructors, key informants such as data-rich curriculum groups, and leaders in the Project EDDIE Community

3) Webinars on teaching with large datasets

- Recordings of all webinars are available online, please visit: <https://serc.carleton.edu/215646>



3) Teaching Quantitative Reasoning with Data Workshop

- 42 instructors and educators met to build a community around understanding best practices and identify the needs and challenges associated with teaching quantitative reasoning with large datasets
- Participants contributed activities, course descriptions, and their experiences in essays
- Workshop synthesis: <https://serc.carleton.edu/221393>



Early Outcomes

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

- Multiple benefits of teaching with data: quantitative reasoning, student engagement, student skillset, and scientific literacy
- Effective course structures and strategies include building student confidence, building faculty confidence and ability, and matching student outcomes with evidenced based pedagogy
- 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
- Needs for pedagogical tools and resources such as scaffolding for instructors, strategies for teaching quantitative reasoning with technology, approaches for evaluating student learning

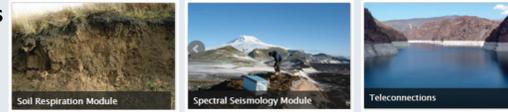
These outcomes are directly informing the design of modules, resources, and professional development programming

Developing Material

We are expanding on the existing suite of EDDIE modules. EDDIE modules consist of a powerpoint, instructor information, student handout, and a copy of the dataset.

1) Refining the original EDDIE modules

- New modules are being produced for Macrosystems Ecology
- Codify EDDIE module rubric



2) Community design and develop of >30 new modules

- Developed by participants in 2.5-day, face-to-face workshops followed by piloting and revision by the module's author(s). Modules designed for flexibility to fit your specific course setting and needs
- Address quantitative reasoning and scientific concepts that span environmental disciplines
- Module structure that engages students with data, foster students to explore through open inquiry, and help student evaluate their learning through discussion

2) Quantitative Reasoning vignettes

- Vignettes will be designed to address quantitative concepts to elaborate on the concepts found in EDDIE modules
- Storylines will be decoupled from a specific module to allow flexibility and include brief lectures and supporting materials
- Topics will be selected based on the Community Needs and the module design process

Module Design and Development Workshops

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



First Workshop: October 28-30, Carleton College, Northfield, MN

Goals: Participants will learn about using large datasets to improve quantitative reasoning, develop an EDDIE module, and pilot that module in their course

Who: We are looking for a group of teachers from post-secondary institutions that represent a range of institution types and disciplines (e.g., earth science, geology, hydrology, climatology, soil science, ecology, etc.)

Cost: There is no registration cost. Hotel accommodations and meal costs will be covered by Project EDDIE. Stipends are available for module completion, which includes authoring, piloting, revising, and publishing any supporting materials.

Applications are due August 25th

To Apply and for more information: <https://serc.carleton.edu/220677>

Fostering Adoption and Use

We will support a series of professional development initiatives to facilitate training and adoption of EDDIE modules.

Future interactive workshops and webinars will introduce new instructors to EDDIE modules and provide implementation strategies. In turn, participants will give feedback on the modules to inform revision and creation of new EDDIE modules.

Participants provide instructor stories about their experience adapting the modules for their classrooms and any addition adaption materials.

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

Project EDDIE Faculty Mentoring Network (FMN) - Fall 2019

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



Participants Information

- 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 strategies and modules ready for implementation in the classroom

To Apply and for more information:

<https://qubeshub.org/community/groups/eddiefmn>

Please visit: projecteddied.org



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Community of Practice



More Information

1) EDDIE Community and News

- Sign up for updates and announcements
- Community contributed essays, teaching activities, course descriptions, instructor stories



2) EDDIE Events

- workshop and webinar support including workshop syntheses and webinar recordings



3) EDDIE Modules: <https://serc.carleton.edu/214407>

- Home for modules and all their support material



4) Project support for

Earth and Ecosystems



Macrosystems



Environmental Data

