

Supporting a sustainable future through geoscience integration in non-geoscience courses using a Faculty Mentoring Network

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QUBES

QUBES is a community of math and biology educators who share resources and methods for preparing students to tackle real, complex, biological problems.



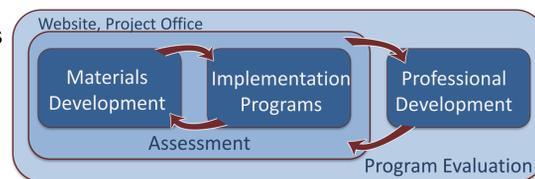
Fig. 1. Map of participants in 2015-2018 Faculty Mentoring Networks. The online platform provides faculty with the opportunity to collaborate with others from around the country over the course of an entire semester. Map by Hayley Orndorf.



InTeGrate

The goal is to develop curricula that will dramatically increase geoscience literacy of **all undergraduate students**, including the large majority that do not major in the geosciences, those who are historically under-represented in the geosciences, and future K-12 teachers, such that they are better positioned to make sustainable decisions in their lives and as part of the broader society.

Fig. 2. InTeGrate utilized a systems model for the development of materials for the geoscience community.



Check out the InTeGrate materials at:
https://serc.carleton.edu/integrate/teaching_materials/modules_courses.html

Visit the QUBES website for this and other opportunities:
qubeshub.org

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2018 InTeGrate-QUBES FMN

Goals: (1) To provide support to biology faculty as they incorporate interdisciplinary materials into their biology courses. (2) To expand the InTeGrate community.

Recruitment. Faculty mentors with the support of QUBES and InTeGrate staff, advertised the FMN opportunity. In addition, the FMN was advertised on a variety of listservs.

Virtual kickoff. The 2-hour meeting had specific objectives: (1) introduce InTeGrate; (2) learn about the QUBES website; (3) describe the goals of the FMN over the Spring 2018 semester; (4) describe the requirements of the FMN (e.g. biweekly meetings, implementation, instructor story).

Biweekly meetings. The participants were divided into two working groups who met with a faculty mentor on a biweekly basis. The faculty mentor facilitated the first two sessions and the following sessions were facilitated (with support) by the faculty participants. *Topics included:* assessment, systems-thinking, implementation, writing.

I think the bi-weekly chats were extremely helpful. I also think that having specific deadlines and making the commitment majorly increased the likelihood that I would implement new lessons, otherwise I might have ended up not doing it.

Table 1. The 2017 InTeGrate-QUBES FMN included 11 faculty members and >600 students* in >12 courses*

Courses (approx. students enrolled)	InTeGrate modules
Art and Ecology: Understanding Changing New England Landscapes (17)	➤ Cli-Fi: Climate Science in Literary Texts
Biology and Society (284)	➤ Carbon, Climate, and Energy Resources ➤ Climate of Change: Interactions and Feedbacks Between Water, Air, and Ice ➤ Systems Thinking
Ecosystem Ecology: A Biogeochemical Perspective (15)	➤ An Ecosystem Services Approach to Water Resources ➤ Interactions between Water, Earth's Surface, and Human Activity
Introductory Biology (majors; 32)	➤ Climate of Change ➤ Environmental Justice and Freshwater Resources ➤ Ocean Sustainability
Environmental Science (non-majors; 60)	➤ Environmental Justice and Water Resources ➤ A Growing Concern Unit ➤ Climate of Change Unit ➤ Ocean Sustainability Unit ➤ Earth's Thermostat Unit
Environmental Science (majors; 24)	➤ Environmental Justice and Freshwater Resources ➤ The Wicked Problem of Global Food Security ➤ Carbon, Climate, and Energy Resources
Nutrient Transformations (15)	➤ Wicked Problem of Global Food Security
Science, the Environment, and Sustainability (49)	
Sustainable Human Ecology (15)	

*preliminary data

Outcomes

How likely are you use the following types of educational materials generated by other participants in your FMN?

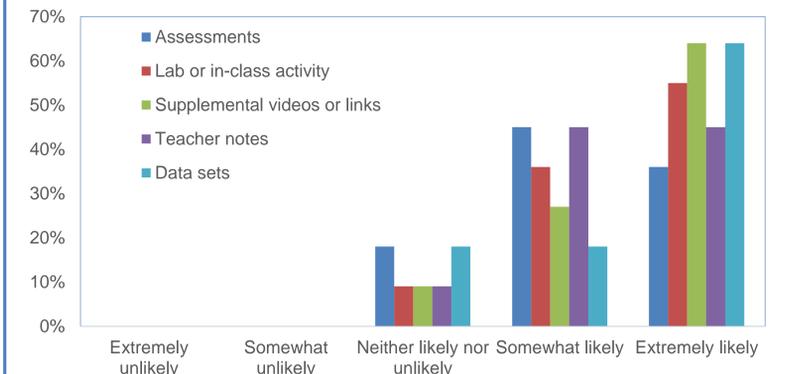


Fig. 3. QUBES provided "Collections" and "Project" space for the sharing of instructional materials

I really enjoyed the FMN experience. Without funds for professional development, this allowed me to participate in collaborating with others in innovative teaching practices.

Would you be comfortable going to another FMN participant to...

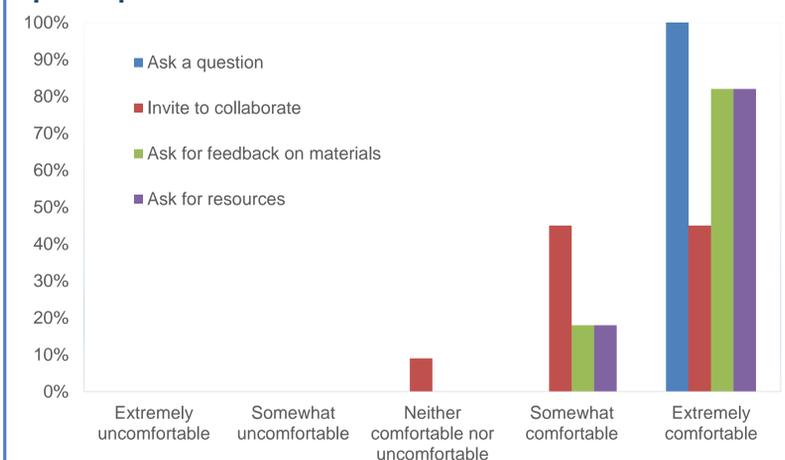


Fig. 4. The FMN emphasized collaboration between mentors and participants.

I really enjoyed my experience. As a new instructor it was amazing to hear...about their experiences - both to get hints and to know that some challenges are common for everyone.

How likely are you to continue to use the educational materials you generated in the FMN in your future classes?



Fig. 5. The FMN supports the continued use of new materials.