Rockstars of Geology: An Assignment to Increase Visibility of Geoscientists from Diverse Backgrounds in an Introductory Level Geology Course

Prajukti (juk) Bhattacharyya
Geography, Geology, and Environmental Science

Introduction

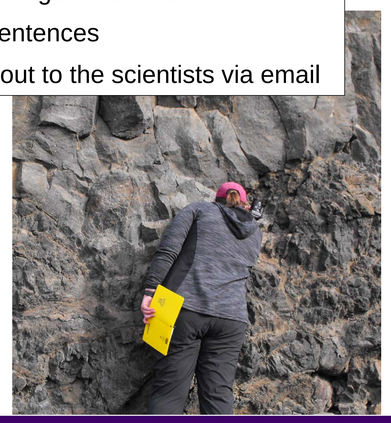
- Research (e.g., Fig. 1) shows the positive impacts of role models from similar ethnic and cultural backgrounds on students underrepresented in the STEM disciplines.
- References and examples of BIPOC and female geoscientists making significant contributions to the discipline are extremely rare in the textbooks and other course materials I use for teaching.
- This project aims to address that gap

Figure 1. *Four recommendations to consider when exposing students to role models as a means of boosting their STEM motivation.*
Infographic from: Gladstone, Jessica & Cimpian, Andrei. (2021). Which Role Models are Effective for Which Students? A Systematic Review and Four Recommendations for Maximizing the Effectiveness of Role Models in STEM. International Journal of STEM Education. 10.1186/s40594-021-00315-x.

Project design

Rockstars of Geology Assignment: Description

- Create a series of PowerPoint slides on the contributions of geoscientists from underrepresented backgrounds in different geoscience fields.
- Use those slides as part of my class presentations as we cover different topics during lecture.
- Students will be asked to find more information about those scientists, specifically:
  - what they do
  - how they got in the field
  - what got them interested in the geosciences
- Summarize their findings in 3-5 sentences
- Receive extra credit if they reach out to the scientists via email



Project design contd.

Rockstars of Geology Assignment: Design

- Scientists for this assignment were mainly selected from the recipients of the Geological Society of America Bromery Award recipients
- This award recognizes *"...any minority, preferably African Americans, who have made significant contributions to research in the geological sciences, or those who have been instrumental in opening the geoscience field to other minorities*."
- Used publicly available award citations and other information for selecting "Rockstars"
- A non-traditional STEM student who has not taken any geoscience course helped select the scientists in order to:
  - Minimize confirmation bias
  - Make sure that the scientific research is interesting and appealing for non-majors
  - Get the perspective from a student from an underserved background

- I reached out to the scientists for permission to use their work and photos in my courses (still on-going)
- A graphic design major designed a "proof-of-concept" slide (Figure 2) as an example of slides I plan to use for this assignment in Fall 2022.

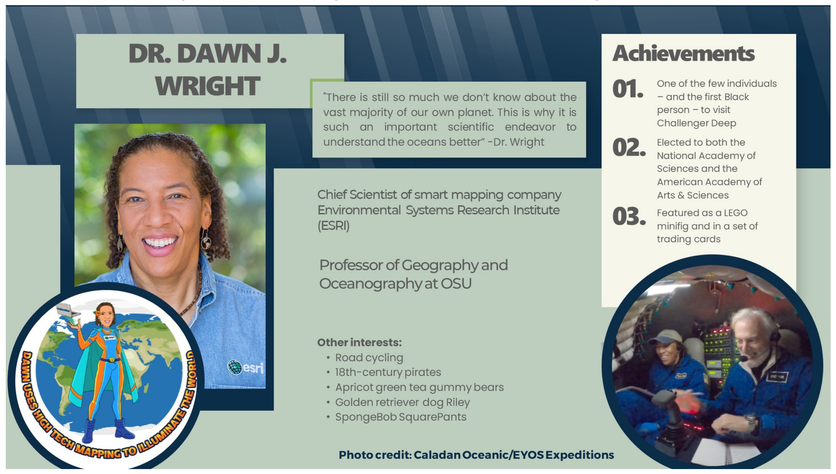
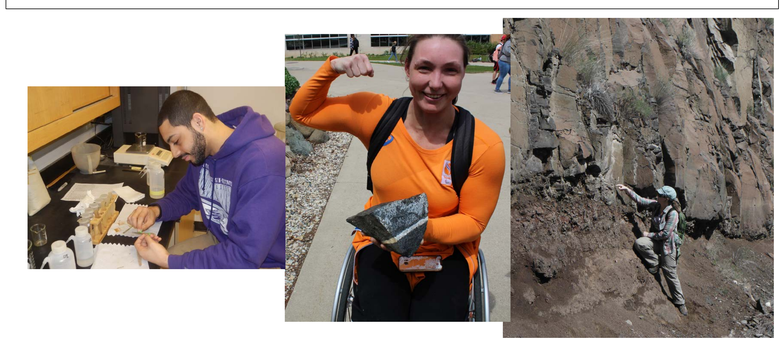


Figure 2. *"Proof-of-concept" slide as a template for the Rockstars of Geology assignment created by Esther Jeninga, a Graphic Design major at UW-Whitewater who has not previously taken the Principles of Geology course. Slides like this will be used to introduce the assignment at frequent intervals during the semester as different course topics are covered in class.*

Discussion and Future Work

- The geoscience disciplines are some of the least diverse STEM disciplines (e.g., Bernard and Cooperdock, 2018)
- Positive role models are shown to have an impact on students' attitudes towards STEM disciplines (e.g., González-Pérez, Mateos de Cabo, and Sáinz, 2020; Gladstone and Cimpian, 2021)
- The "Rockstars of Geology" assignment focuses on the contributions of BIPOC and female geoscientists to the discipline, and provides exposures to "Scientists who look like me" in the context of the course
- This assignment is integrated throughout the semester as opposed to being a "one-time" activity for sustained impact
- The assignment is self-guided by the student and they are responsible to learn more about specific scientists in context of the course topics being discussed
- It is flexible enough to be used in different geoscience courses
- The scientists who are selected to be part of the assignment are invited to provide any information they would like to be included in it
- The effort must go beyond only the Bromery Award winners to highlight all the different topics covered in the introductory geology course
- Information gathered from student responses can be used to gauge student interest levels in different geoscience topics and can be used for recruitment and retention efforts



Literature Cited:

Bernard, R.E., and Cooperdock, E.H.G. (2018) No progress on diversity in 40 years. Nature Geoscience 11, 292–295. https://doi.org/10.1038/s41561-018-0116-6

Gladstone, J and Cimpian, A. (2021) Which Role Models are Effective for Which Students? A Systematic Review and Four Recommendations for Maximizing the Effectiveness of Role Models in STEM. International Journal of STEM Education. 8 (59) 10.1186/s40594-021-00315-x

González-Pérez S, Mateos de Cabo R and Sáinz M (2020) Girls in STEM: Is It a Female Role-Model Thing? Frontiers in Psychology 11 (2204). doi: 10.3389/fpsyg.2020.02204

Acknowledgements

The presenter acknowledges funding from the LEARN Center for this summer project. She also appreciates the input from Ms. Jessica Kienbaum for designing the assignment and from Esther Jeninga for slide design. Feedback and input from the members of GSA Diversity Committee have enriched this project and will be invaluable in modifying the assignment in future.

UNIVERSITY OF WISCONSIN WHITEWATER
Department of Geography, Geology, and Environmental Science