

Issues in Earth Science

“Topics for Debate”

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Two Things I Learned from Online Teaching

by
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In the middle of March, 2020, Minnesota enacted a stay-at-home order to help flatten the COVID-19 curve. Teachers at my school, district and state began thinking about how to finish the school year online—how to teach

at-a-distance. Nine weeks later, I saw face-to-face teaching with fresh eyes. Though my thoughts may not be new to many teachers, I wanted to share what I've learned from online teaching.

The first thing I've learned is that, although in-person teaching and learning occurs on a two-way, well-lit street, teaching online often occurs in a narrow alleyway and I stumbled in shadows, senses muffled by layers of technology. Things easily noticed in the classroom, like the frown or squirm of a struggling student, were obscured online. Unlike the in-person class, every online transaction had to be planned and then filtered through multiple devices. Unlike the in-person class, where productive struggle was welcome and where I could immediately coach students through difficult moments, I found myself simplifying assignments so my students weren't overwhelmed. In the in-person class, my students and I had the communal satisfaction of persevering through productive struggle. This sense of accomplishing something important was absent for me in the online setting.

Honestly, for the first 2 weeks of distance learning, I liked not having to deal with classroom management issues. But now? Bring 'em back. It is in those messy interactions that trusting relationships, reasons for learning, and practice in critical thinking are forged.

The second thing I learned begins with the fact that I struggled to find ways to engage my students with the practices of science; situations in which they needed to figure something out in an authentic way. My lessons instead seemed to focus on learning *about* scientific discoveries, models and laws. During this time, I developed a new appreciation for the variety of online resources that support classroom-scale Earth system science. Our governmental science agencies – NWS, NOAA, USGS, NPS, and NASA*, to name a few – are a gold-mine of data and observations of phenomena at different scales within the Earth system.

For example, my students used the website for Hawai'i Volcanoes National Park. The site's video, text, webcams, before-and-after images, timeline, and maps became a way for my students to interact with real data. The interesting phenomena included the 2018 cessation of

Kilauea's 30-plus year eruption, the destruction of more than 13 square miles of land by lava flows, and the addition of 875 acres of new real estate to the island. With these resources, I was able to bring a little bit of the practice of science into my distance learning class. Thank you to those agency scientists and outreach educators who work with such curiosity and integrity to understand how Earth works and to share their observations and ideas with the rest of us.

As this experiment in education concludes and students 'leave' for summer vacation, I have the sense that online teaching provides the MREs of education. Meals Ready-to-Eat are good nutrition for a soldier on the battlefield where there is no better option, but in the long run they are a poor substitute for a feast, expertly prepared and served in the company of friends.



*Acronyms:

NWS: National Weather Service

NOAA: National Oceanic and Atmospheric Administration

USGS: United States Geological Survey

NPS: National Park Service

NASA: National Aeronautics and Space Administration

Mary Colson has taught earth science for 30 years in Tennessee, Texas, and most recently in Moorhead, MN. She is a past president of the Minnesota Science Teachers Association and previously served as the District 9 director for the National Science Teachers Association Council. Mary worked as a member of the Next Generation Science Standards writing team and as consultant for Achieve Inc. to develop science/math tasks and evidence statements for the middle school and high school NGSS for Earth and Space Science. She served on the Minnesota Science Standards Review Committee (2009) and as co-chair of Minnesota Science Standards Review Committee (2018-2019). Her workshops on how to teach science as a practice are in high demand.

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