Engaging the online lab STEM student

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TEACHING TIP

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One of the great challenges in any educational endeavor is getting students motivated to take ownership over their own learning and online students have a particularly diverse range of motivations. Many are more time challenged than traditional residential students. However, offering these learning experiences online can also attract students who are more hungry for the opportunity to advance themselves. Sometimes, online cohorts resoundingly outperform traditional cohorts for this very reason.

MAKE IT RELEVANT

A well designed lab kit and a crisply structured plan of study can still seem meaningless when it ignores the interests and contexts of students. Just as a face-to-face lab might be influenced by discussions in class, current events in science, or the personal goals of a cohort, online labs can too. Where possible, relate activities to students within their local contexts. Does a student have a particular question about an aspect of their environment? Frame an activity that involves outside exploration, methodical observation, or sample gathering. Is there an issue in their local community that can benefit from a scientific analysis or inquisition? Encourage them to seek this out. A self-designed lab assignment can get students thinking creatively early in the semester. This immediate relevance and deep reliance on the funds of knowledge that each student brings can improve engagement and hopefully outcomes.

HAVE STUDENTS EXPLORE TOGETHER

Making connections can be more difficult for online students, but it can be done and done well. Assigning or allowing students to choose lab partners can fulfill a needed social component as well as give them a point of contact and support as they move through a course. While it might not seem as directly advantageous as lab partners in a physical lab, students can help one another as virtual lab partners. Tools such as Slack or Google+ can be very helpful for creating community among your students.

MAKE IT AUTHENTIC

Making the process of discovery as authentic as possible should be one goal of any lab experience. UAF has a great of example of this in Dr. Abel Bult-Ito's Massive Online Research Experience (MORE) course. In the course, now undergoing its fifth semester of delivery, students learn background research about a topic, become skilled in the methods of research within that area, and then ask their own questions and perform their own research in search of answers to their own original questions. They even choose their own novel experiment to conduct at the end of the course. Not all subjects lend themselves easily to this kind of inquiry, but where possible, authenticity of investigation can be very engaging.

BE PRESENT

An online lab course is no different than any other in one regard: the vital role of the instructor. As Dr. Richard Collins states, "You still have to remain connected to the students. A cool [course] site is not a real connection." A meaningful connection between student and instructor increases the feeling that students are getting something valuable from their experience, and their sense that they are being supported in their learning. Instructor presence can take many forms, not all of them obvious or labor intensive. Many instructors achieve this by maintaining a consistent role in discussion forums, participating frequently and actively enough to let students know they are there and paying attention. Another method is to send announcements throughout the week at key times. This can regain students' attention during their busy schedules and jumpstart their mental engagement even outside of their actual coursework.

One popular and effective method of injecting presence and personality into a course is using short instructor videos to guide students and add perspective and experience to the core concepts of a course. Dr. Bult-Ito's MORE course includes 110 videos, averaging just 4 minutes in length. The videos contain discussion of important background information, screencasts to explain how to collect data, or how to interpret the results. Watch an example of one of the videos on YouTube. Dr. Bult-Ito concluded that "the presence of the instructor in almost every component of the MORE courses made a difference." One student even said, "I felt I knew Dr. Bult-Ito better than one of my in-person teachers."

Engaging hearts and minds can yield great results for instructors and students. Sometimes, one can even reach the promised land of self-motivated learners.

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