

Remote-teaching strategies that keep introductory animal sciences students engaged and actively learning

Introduction

Engaging introductory students in course content is essential in keeping them academically focused and to spark their interest in the subject. During the COVID-19 pandemic, instructors faced the added challenge of accomplishing these goals through hybrid and virtual learning. During the fall 2020 semester, I served as an undergraduate teaching assistant (TA) for an introductory animal science course (AnSci 101). In this role, I used my unique position of both peer and instructor to relate to the students while gaining a better understanding of the effort instructors must give to make virtual learning effective. This Teaching Tip describes two remote teaching strategies I used to maintain student engagement during my TA experience.

Taking AnSci 101 from traditional to remote teaching

The instructional team for AnSci consisted of one lead instructor, one graduate teaching assistant (TA), and three undergraduate TAs. In a typical semester, AnSci 101 includes large group lectures and smaller hands-on lab sections. For fall 2020, the lead instructor converted lectures to asynchronous videos, and the four TAs worked together to plan and facilitate 11 virtual and two in-person labs. To keep students engaged in the course's synchronous labs, our instructional team utilized a variety of creative strategies.

Facilitating social learning with multi-modal virtual discussion strategies

Breakout groups were an important piece of each virtual lab so that students could discuss the material and report back to the class. Based on informal student feedback, it was found that these activities helped them better connect with one another, but the majority of the learning occurred during the large group setting. The small groups were an important factor in maintaining the class's social presence but were not the primary source of knowledge that students gained. One challenge with this format was that students could turn off their cameras and work individually instead of engaging with the group. Increased interaction between the TAs and the students during these activities may have prevented passive participation. After breakout sessions, the whole class would reconvene to give presentations on their findings which students found to be a beneficial component. Students also reported that hearing from the instructional team during whole-class meetings was important to their learning. Therefore, using a blend of large and small group work seemed to give the most balance to the class.

Livestreaming demonstrations and Q&A with experts

Another challenge was teaching complex scientific topics without having tangible materials for the students to engage with. In a regular semester, students would have the opportunity to work with a wide variety of animals, tour farms, and perform several dissections. Due to COVID-19, many of these opportunities were not feasible, so the instructional team looked to alternative options. One method was using live video streaming technology to perform demonstrations instead of discussing the activity in a slide show. The human brain processes words separately from visual stimuli (Abdulwahed and Nagy, 2009), so using a variety of teaching techniques engaged students in different ways. For detailed activities such as dissections, the live demo allowed students to ask questions as the procedure was performed. Because of the livestream, the experience was tailored to the needs of each lab section to facilitate dialogue and understanding. All participants had the opportunity to learn from the same guest professor, which our instructional team found beneficial compared with previous in-person labs in which the guest professor rotated among student groups. Other benefits to having students observe a live dissection include the decreased requirements for animal use, decreased costs of tissues and supplies, and reduced labor to set up the activity. A similar technique was used when teaching about various animal production systems. Since students could not visit research facilities and farms in person, a live stream provided the opportunity to have a tour with experts in the field. Having the guest speakers gave students a chance to hear from other points of view and see different farming facilities firsthand.

Encouraging participation with regular pre-lab and post-lab assignments

Throughout this unusual semester, there were some added benefits to the new format which will be retained when classes return to in-person instruction. Prior to the pandemic, the lab section of AnSci 101 emphasized hands-on experience with a wide variety of topics. However, since lab assignments were completed during class time, there was no material outside of class for students to use to reinforce concepts. Due to the online structure and need to engage students further, the instructional team implemented assignments to complete before and after each lab session. According to Kolb's experiential learning theory, reflection is one of the critical components of learning (Abdulwahed and Nagy, 2009). The goal of the instructional team was to incorporate this aspect into assignments in order to give students context for the day's topic and a way to reflect after class. It is also more beneficial because it prepares the freshman students for the upper-level science courses they will take later in their college careers. Using a critical thinking approach will teach them to be better scientists and will better prepare them for their future coursework. The assignments also facilitated discussion during class because students would feel more comfortable participating if they prepared answers in advance. The TAs could also ask particular students to expand on their ideas from the online discussion board. Outside of class, the TAs had the opportunity to engage with students by commenting on post-class discussion topics. Because of these added benefits, when classes resume on campus, it is anticipated that this format will continue.

Conclusions

Overall, the COVID-19 pandemic has affected all areas of life—especially education. Finding creative solutions to keep students engaged and interested in the material is critical for success. Providing engaging class activities such as live demonstrations helps them better understand complex material and allows them to ask questions for clarification. Finally, providing more individual activities before and after class gives students context for the material they will learn and helps them reiterate it after class.

References

Abdulwahed, M., and Nagy, Z.K. 2009. Applying Kolb's experiential learning cycle for laboratory education. *JEE*. 98(3):283-294.

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