Student Engagement and Student Learning at the Centre of Low Stakes Assessments

Instructors in the College of Biological Science adopt strategies that take familiar methods of assessment, and maximize their impact on learning, engagement and instructional resources.

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**In this article:** two courses, six methods of assessment, four instructors.

**Find out more about:** the six different assessment methods, what courses are using them, challenges the instructors have faced, student perceptions and responses, and resources to help you get started.

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**Embedded Pop-Up Quizzes in Pre-Recorded Lessons**

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**Why Should You Try It?**

We have all done it...watched a video with the intention to learn and found part way through, we got distracted. Whether we picked up our phone, are trying to multitask, or got talking with someone—simply put, we are not giving the video or learning our full attention. Now, imagine you’re a student (particularly in the last two years) and you have pre-recorded lectures for multiple classes and perhaps, for labs as well. What can we do, as instructors, to make the lessons a little more engaging and learn where students are understanding the material and what topics would benefit from being re-visited?

Pop-up quizzes, embedded into pre-recorded lessons encourages viewers to engage with the material, with the option of using them as a low-stakes grading opportunity. This method is presently being used by lab course instructor, Dr. Chris Meyer, in a 2000-level Molecular and Cellular Biology (MCB) Introductory Plant Biology course (BOT*2100). During the pandemic, Dr. Meyer created interactive pre-recorded lab videos, lasting 8-15 minutes in length. During these videos, Dr. Meyer covers key terminology and walks students through an experiment. The quiz, which pops up at a specific time point, becomes a way for students to test themselves on what they’ve learned so far in real-time.

Using Microsoft (MS) Forms, the quiz questions can be allotted points, and students receive a grade. The quizzes can serve multiple purposes: they can contribute to students’ final grades; they help keep students engaged while watching the videos; and they offer the instructor(s) insight into areas students are struggling with using the statistics MS Forms tracks on the “backend” of the quiz.

Dr. Meyer was motivated to create lab demonstration videos with pop-up quizzes because, “during the pandemic, we wanted students to get a visual experience of the lab activity, and add an active learning element, where students could test themselves.”

The quizzes were taken up during each synchronous lab meeting. Questions with lower scores were elaborated on and clarified through open discussions, allowing
students to sort out any misconceptions promptly, a helpful strategy to ensure learners are having a good foundation of knowledge and understanding to build upon.

Do you have to use the quizzes as a low stakes assessment? No, and in fact, Dr. Meyer did not use the quiz grades towards students’ final grade. However, here are a few approaches you can consider: (1) use the quizzes as a participation mark in the course, irrespective of their grade on the quizzes; (2) use the point system and count the quiz grade towards the students’ graded items.

Of course, there are other interesting ways to use pop-up quizzes for low-stake grades that best meets the needs of both your teaching and the students’ learning (which we, at COESP, would be happy to know about and share).

Incorporating Embedded Quizzes Into Your Instructional Practice

You will need...

1. A phone or camera to film your video, or a software platform on your computer to record a lecture-style lesson
2. Access to Microsoft Stream (https://web.microsoftstream.com/) to upload your pre-recorded lesson

How to create the quiz

- In MS Forms, click “+ New Quiz” and follow the directions
- There are a variety of question types to work from (e.g. multiple choice, short answer)
- Points can be assigned to each question

Embedding the quiz into your video lesson

- With the quiz open in Forms, click the “Share” button and “Copy” the quiz URL
- Go to MS Stream and select the tab “Interactivity” (located beside the video window)
- Click “+Add Form” and paste in the quiz URL, name the quiz
- Place the quiz at the desired time using the slider on the video (white circle on the video window)
- Click “Add to timeline”

PRO Tips

- Include instructions at the top of your quiz in the description
- Include a link for the quiz URL in the video description. Stream videos accessed on mobile devices may NOT support the pop-up quizzes. Having the URL allows students to still access the quiz

How Well Does this Method Pivot Between Remote and In-Person?

Access to pre-recorded lessons with embedded quizzes is suitable for both in-person and remote learning environments. For in-person situations, this may take the form of pre-lab lessons or recorded lessons which then flow into topics covered in lecture. There is also the option of continuing the model some instructors have used during covid, with lessons being pre-recorded and in-person classes being an opportunity for discussion, clarification, or to engage in active learning and application of pre-recorded material. Ultimately, it is up to individual instructors to make these
decisions in the best interest of their students and within the limitations of their resources.

**Preparing Students For This Assessment**

Inform students about the embedded quizzes, including how to access the quiz using the link in the description. Having clear instructions about why you have the pop-up quiz and how to answer the questions (in the MS Form) will contribute to student success.

**Student Feedback**

Direct feedback from students on their thoughts regarding the embedded quizzes was not collected. Dr. Meyer noted, students completed the quizzes (in some cases shortly before their synchronous lab), and this was helpful for engaging and familiarizing them with the material prior to discussions.

**Additional Resources**

1. Association for Biology Laboratory Education – ABLE Web. They are a North American Group of dedicated and passionate biology lab educators. ABLE web has articles and forums! [https://www.ableweb.org/](https://www.ableweb.org/)

2. Sample from Dr. Chris Meyer using time-lapse video with an embedded quiz. [https://web.microsoftstream.com/video/40a810b1-c603-444b-a94e-19959158d5cd?list=user&userId=9f56c124-c560-47d2-8301-d36a4af13a24](https://web.microsoftstream.com/video/40a810b1-c603-444b-a94e-19959158d5cd?list=user&userId=9f56c124-c560-47d2-8301-d36a4af13a24)

3. How to embed pop-up quizzes into a video using Microsoft Stream and Microsoft Forms. Longer description of quiz embedding process by Dr. Chris Meyer. [https://www.uoguelph.ca/ada-cbs/system/files/How%20to%20Embed%20Quizzes%20in%20Stream%20Videos%20-%20CJMeyer%5B74%5D.pdf](https://www.uoguelph.ca/ada-cbs/system/files/How%20to%20Embed%20Quizzes%20in%20Stream%20Videos%20-%20CJMeyer%5B74%5D.pdf)

**Multiple Methods of Assessment to Maximize Student Learning and Instructor Resources**

**Why Should You Try It?**

First, let’s think about one of Albert Einstein’s famous quotes, “Any fool can know. The point is to understand.”

How can we support understanding? One way is by providing students with a variety of assessments using a diversity of formats, all of which are intentionally designed to engage the learner using real-world application of lecture-learned content.

Multiple methods of assessment can be showcased by a 2000-level Evolution course (BIOL*2400) taught by Dr. Ryan Gregory, Dr. Colin DeMill, and PhD Candidate, Katherine Drotos from Integrative Biology to a large class of more than 400 students. It is a core course for many majors in CBS. In this course, there are five methods of assessment, including: regular multiple choice quizzes, TA-led seminars for participation, take-home/open book/collaborative midterms and exams, simulation assignments with worksheets, and a term project.

Motivated by the COVID-19 closure of the universities to in-person learning, the course was reformatted last year for remote teaching, and new this year, it has transitioned into a distance education (DE) course, complete with student engagement, active learning, and multiple methods of low stakes assessments, included active learning and collaboration.
Before sharing some of the approaches the instructional team bring to the course assessments for BIOL*2400, it is worth noting the philosophy that underpins their assessment design. Academic misconduct has been a subject of discourse, particularly since moving remote. With a focus on what leads to cases of academic misconduct, the team designed assessments with a philosophy of good faith that students would not resort to cheating if the motivation to cheat was reduced. They considered the *whys* of what causes a student to feel desperate/stressed, such as, not having enough time, not understanding, not having clear instructions, etc., and designed assessments that proactively responded to these challenges. Students were given multi-day time windows and were encouraged to collaborate, using an acknowledgement section and noting who they worked with and how each person contributed. This was encouraged for all assessments (including the midterm and final exam), except the quizzes, and led to very positive outcomes for student accessibility, collaboration, and academic integrity.

**Where Can You Start?**

**Regular multiple-choice quizzes**

The term started with 5 quizzes worth 15%, and in response to the impact of remote learning on students, it was modified to 4 quizzes. The quizzes are setup on CourseLink, meaning they are instantly and automatically graded with grades entered. Each quiz was worth 3.75%, differing from multiple choice questions on heavily weighted exams, where each question influences a students’ mark more significantly.

The instructors create *juicy* questions that test understanding and application of lecture-learned knowledge using scenarios and real-world application of content (i.e. you can’t google the answers).

**TA-Led Seminars for Participation**

Teaching assistants met early in the week prior to their seminars and planned discussion topics and/or annotation activities relating to the content from the lectures that week; one TA would create a Power Point based to the plan and then the TAs would lead each of the seminars in pairs. Participation during the seminars included any meaningful contribution to the conversation, whether in the chat, via turning their mic on, or an annotation added to the Power Point slide activities. All forms of participation were tracked over the semester and contributed to 5% of students’ participation grade. The other 5% of the participation mark required students to write a reflection at the end of the semester describing something they learned in seminar. Students were not required to participate every week; they could participate in approximately half the seminars and still get full participation marks. This was done in an effort to reduce stress, increase flexibility and allow for more authentic participation.

One TA, MSc student, Christine Mishra, commented, “students really liked [the annotation] activities. We would have a diagram to fill in or prompt to respond to on a blank slide, and it was connected to a concept from lecture, and that would be the starting point for more discussion.”
Take-home, open book, collaborative exams

Rather than using timed exams, the approach taken in BIOL*2400 was to create flexible, lower-stress exams that included active learning components such as assembling and interpreting data and running simulations. Similar to the quizzes, questions test understanding and real-world application of lecture-learned knowledge. The exams remain open for a week or more, and students work on them at their own pace, making as many attempts as they want. They were encouraged to work together on the exams.

Students reported that the exams were challenging but engaging, much lower stress than traditional exams, and provided additional learning opportunities while completing the active components. There were almost no cases of academic misconduct reported based on this format, and even some students who worked together entered different responses after discussing and debating the questions.

The instructors have indicated that they do not intend to return to using timed exams after this very positive experience. For the DE offering of the course this fall, the exams were eliminated and replaced with six active learning case studies assessments. Each assessment focuses on two units, and builds on previous content as the semester progresses.

Simulations Assignments with Worksheets

Students were given something to do, for instance, run a simulation using web-based software, such as Avida Ed, that encouraged them to solve an interesting, real-world evolution challenge. For each assignment, students were given a worksheet to complete as they navigated the exercise. Upon completion, students then accessed a multiple choice quiz on CourseLink where they responded to questions that took the knowledge gained from the assignment and applied it. It was not questions that could be answered simply by looking at the content, Drotos says, “[students] had to understand it.”

Term Project

The term project offers the most creative opportunity for students. They are asked to design a teaching tool for any evolution concept of their choice.

Students have the freedom to choose how they want to teach (e.g. pamphlet, board game, video, etc.), and they can decide who their audience is (anyone from children to grandparents and in-between).

The project is supported by a proposal, which receives feedback from TAs (one of the bigger grading responsibilities).

It is fun to grade and fun for the students to do.

How Well Does this Method Pivot Between Remote and In-Person?

Any of the assessment methods described in this section can be used in a class that is offered in-person, remote or through distance education. The lectures for remote teaching were pre-recorded and asynchronous, with all assessment methods acting as a complement to lecture content. When offered in-person, the lecture content would be the biggest element that transitions, not the assessment methods.
Preparing Students For These Assessments

1. To set students up for successful collaboration with their peers, students were instructed on the differences between plagiarism and collaboration.
2. Instructions and guidelines were clearly outlined for all assessment methods.
3. When students are unsure about what to do for their term project, they were encouraged to talk to TAs, and the instructional team to gather ideas and feedback. The process from proposal to designing a teaching tool, and its challenges is normalized as being a positive part of the learning experience.

Student Feedback

The response from students to using these different forms of assessment has been positive, and Drotos, who is instructing the distance education version of the course this fall, commented,

“The discussion board is very busy, with students sharing interesting articles and creating a sense of community online.”

Given its newness as a distance education course, the instructional team is looking forward to gathering more feedback from students.

PRO Tips & Additional Resources

Pro Tips

*How do you find the simulations you use in your assignments?* There are a few ways to find simulations to use for assignments:
1. Use a search engine (e.g. Google) and enter your discipline or topic and add "teaching tool." There are a lot of options, many are aimed at high school students, and are ok for 1st or 2nd year introductory classes.
2. Social media (e.g. Twitter) conversations about teaching. It can be helpful to follow librarians and instructors at other institutions. Follow up with them and send direct messages.
3. Through casual conversations with colleagues (e.g. sharing resources).
4. Attending seminars/events by COESP. For example, in 2016 Dr. Jim Smith from Michigan State University was invited to present and shared insights about simulation software, Avida Ed.

*How do you come up with really good multiple choice quiz questions?*
1. It is important to make questions relevant for students, and by putting them in a real-world mindset. Starting questions with, “Imagine you’re a...” is a good starting point.
2. To create *juicy* questions, use questions that require understanding of the material and include options that are common misconceptions. The latter is not to ‘trick’ students, rather it promotes comprehension and understanding of the content so they can apply it to real-life scenarios. Questions like, “Which statement is true/false” are good.

Resources

1. Avida Ed [https://avida-ed.msu.edu/](https://avida-ed.msu.edu/)
   Popular evolution simulation software sites.
2. COESP Presentation: Innovative Assessment [https://www.youtube.com/watch?v=zXMpA1dC0nE](https://www.youtube.com/watch?v=zXMpA1dC0nE)

Thank you for reading!!!
Do you know instructor(s) doing something COOL with their course(s)?

We want to recognize, be inspired by, and share what is happening in CBS, in the following areas:

- Student motivation and engagement
- Course-based undergraduate research experiences (CURES)
- Accessibility
- Equity, diversity, and inclusion
- Indigenizing the curriculum
- High Impact teaching and experiential learning
- Assessment Methods
- Remote & Hybrid
- Practical + Hands-on learning
- Strategies for large classes
- Resources being used (e.g. e-text books, videos, software programs)
- New and Innovative

Please email Jessi Nelson cbscoesp@uoguelph.ca if you want to be included in a future spotlight.

Author Biography
Jessi Nelson-Duck is a Master’s student in Integrative Biology. They love research related to teaching and learning in higher education, making education inclusive and accessible, and conservation of our waters and lands. Jessi is a mom of two hyper, curious, and energetic kids, enjoys reading, listening, singing and dancing to many genres of music, gardening, and camping with their family. Jessi currently lives, works and resides in Ontario on the traditional lands of the Haudenosaunee, Anishinabewaki <σ·J´ ĉ V·<Φ, Attiwoonderonk, and Mississaugas of the Credit First Nations, and identifies as an indigenous ally as we collective work towards truth and reconciliation.