

Changing assessment strategies to help improve student learning

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Abstract

For many instructors, student assessment means exams – typically multiple-choice exams. Unfortunately, multiple-choice tests more often examine students' ability to (a) take a test and (b) recognize terms, rather than assess the students' full knowledge. In planning for a new course this semester, I included a variety of assessments, both graded and ungraded, for my mid sized course (33 students). Along with a few multiple-choice exams in lecture, they have 2 short answer practical exams in lab, an essay, and a project that combines photography of microscopic samples with written descriptions. In class I incorporate ungraded assessment during the lecture by asking multiple questions within lecture and fostering student discussions in lecture and lab. A colleague also teaching biology to undergraduate students has been utilizing exam wrappers to help students self assess during exams. The goal of exam wrappers is to clarify for students how they are actually studying and help them identify study practices that can the students can change as the semester progresses. These diverse assessments provide options for students to engage in active learning and for me to verify the students understanding and learning.

Assessment Options

One of the most common assessments is multiple choice (multiple guess) exams. They are

- Fairly easy to create exam
 - Very easy to grade
- BUT not the best assessment. They
- Don't often test student's knowledge but more their ability to take exams
 - Difficult to write good questions

Graded assessments:

Summative results

- Exams
- Homework
- Quizzes

Critical feedback

- Projects (individual or group)
- Essays or papers
- Oral exams
- Homework

Ungraded assessments:

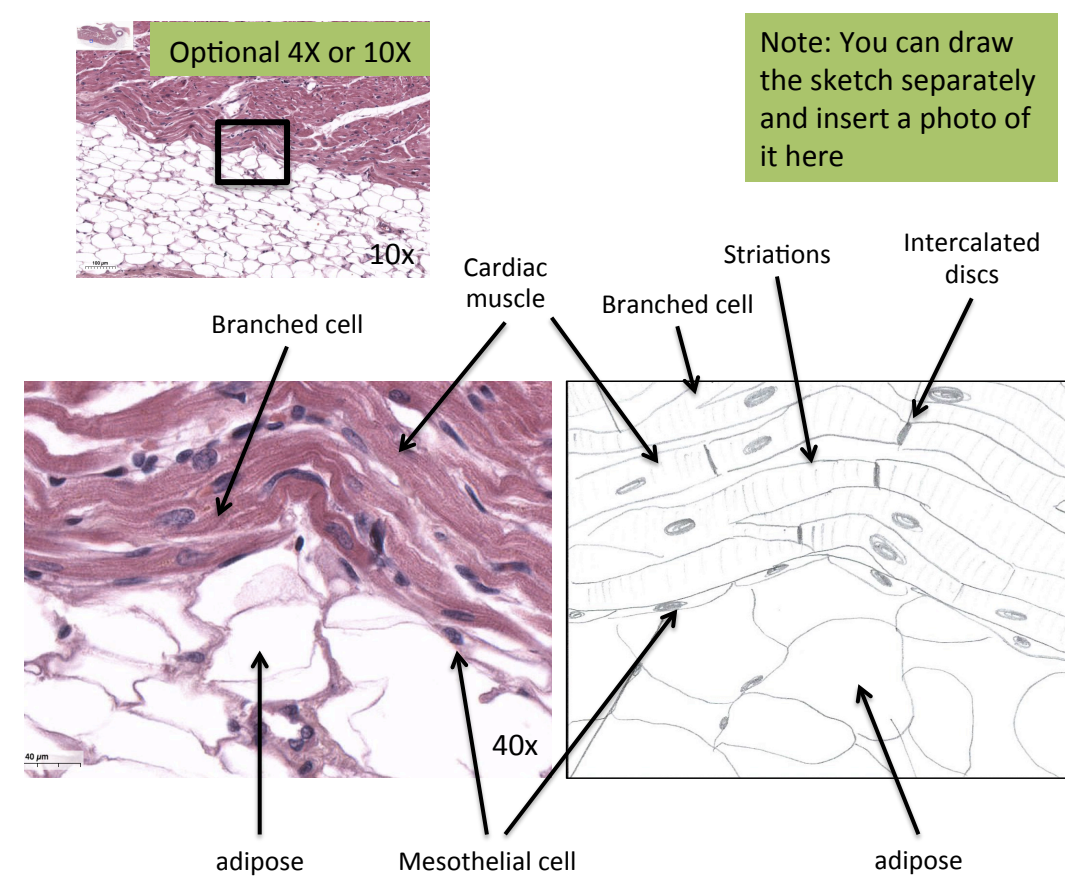
- Class discussion
- In-class question & answer
- Think-pair-share

Lab Project

Active & collaborative learning

Students engage with prepared tissue slides - they view in microscope and search out structures needed to complete a project

Students actively identify structures and tissues discussed in lecture
Students collaborate and check identifications with classmates and the instructor



Note: You can draw the sketch separately and insert a photo of it here

A mockup was provided to students to act as a template and which contained instructions for how to successfully create each page of their project

Throughout the semester, students were encouraged to have the instructor review pages as they were created for comments

Slide title/ Organ
List of tissues shown in this image/ sample "This section shows..."

More in depth description of the tissues shown in the image including interactions with other tissues in the organ, structures that are viewed in this sample that helped you identify this tissue or some discussion of how the structure/form of this tissue is related to the organ's function.

Epithelial Tissues: Slide 1 - Stratified Squamous Epithelium

1st section is more of a list of tissues

This should go under the pictures

Darken arrows

This is great info, but more appropriate for the second paragraph

Talk a bit more about the connective tissue

Epithelial tissue is categorized by both shape and the number of layers. While simple (single) layer epithelia are useful for rapid passage of molecules, stratified (multiple layer) epithelia add protection to underlying tissues. Squamous (flat shaped) cells are ideal for diffusion while cuboidal and columnar cells are function to secrete and absorb substances one and from the lumen of an organ or duct in the body.

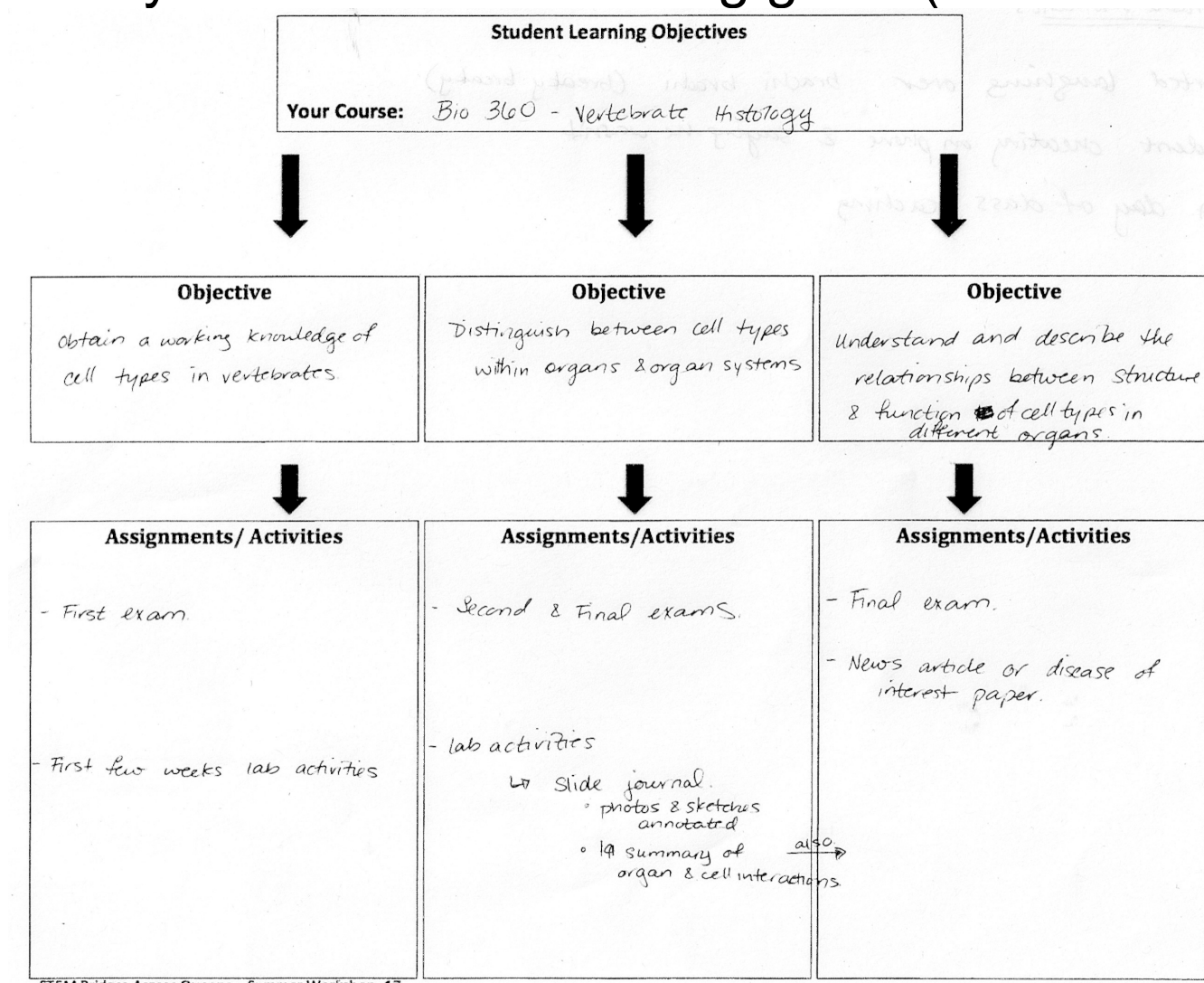
In this slide, we can see stratified squamous epithelium, providing protection to underlying layers. Epithelial tissue are separated from other tissue by a basement membrane. Since epithelial tissue are avascular, below the basement membrane, we will find vascular and innervated connective tissue. Epithelial tissue are also described: the surface touching the basement membrane is referred to as basal, and epithelial tissue grows apically from the basement membrane, with the opposite free face being referred to as the free or apical surface. The side touching another epithelial cell is referred to as the lateral surface.

Students turned in their project toward the end of the semester and received detailed comments and a grade. They each had the option to resubmit the project with edits suggested by instructor.

New Class – What to do?

In planning & designing new course, I focused more on assessments that supported student learning

Assessments were closely matched with learning goals (reverse course design)



Graded Assessments

	Typical	New
3 lecture exams (multiple choice)	25% each	15% each
2 practical (short answer)	12.5% each	10% each
1 essay/ research paper		15%
1 lab project		20%

Reduced the weights of purely summative assessments (multi choice exams). Including formative assessment where students submit their work for grading before a set date with the option to resubmit the final project after revision.

Exam Wrappers

The goal of exam wrappers is to identify how and how often students prepare for an exam. This allows an early intervention and modification of study habits.

Identification Number: _____ Offers Potential Anonymity

Discover if student confidence increases or decreases over the course of the exam.

Reveal how and how often your student is studying. Offers potential studying alternatives.

Reduce the risk of future negative influences

Demonstrate to students that changing answers may not be the best idea.

EXAM WRAPPER TEST # _____

Before The Exam	During The Exam	After The Exam
I thought I would receive roughly a _____% because:	I thought I would receive roughly a _____% because:	I thought I would receive roughly a _____% because:
Study Strategy	Amount of time (hrs)	Were there other factors that impacted your test performance?
Reading the Text		<input type="checkbox"/> Hunger
Reviewing power points		<input type="checkbox"/> Fatigue
Reviewing notes		<input type="checkbox"/> Daydreaming
Creating/Using a study guide		<input type="checkbox"/> Panic/Anxiety
Attending tutoring		<input type="checkbox"/> Personal issues
Studying in a group		<input type="checkbox"/> Test format confusion
Making/Using Flash Cards		<input type="checkbox"/> Mental block
Meeting with Mentors		<input type="checkbox"/> Noise
Other:		<input type="checkbox"/> Temperature of room
Did you?	Yes	No
Read before class?		
Bring Powerpoints to class?		
Take Notes During Class		
Attend Office Hours?		
Miss any lectures?		
Do the Homework?		

The grade I received was _____%

When I first saw my results I felt _____ because:

Why do you think you received the grade you did?

How many questions did you change from the right answer to wrong answer?

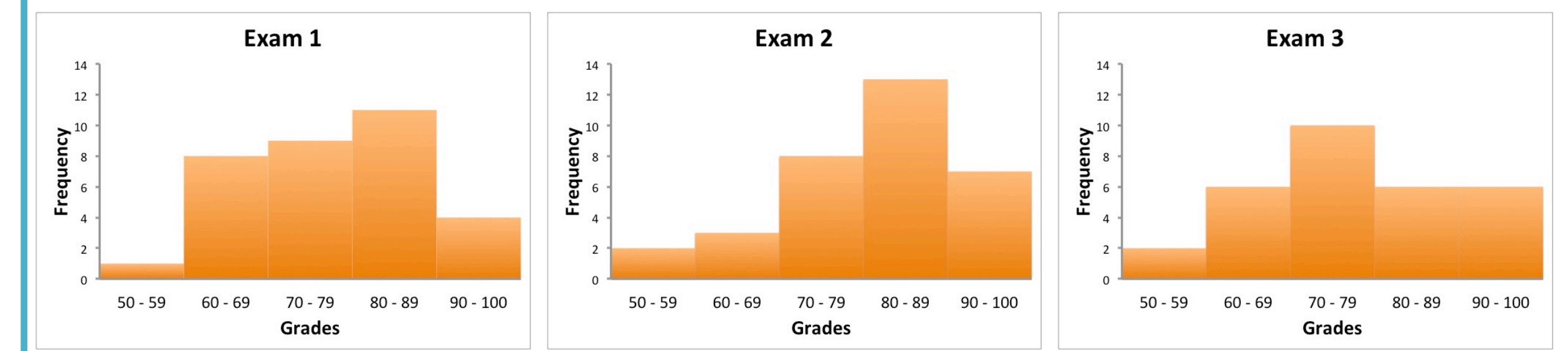
How many questions did you change from the wrong answer to the right answer?

How many questions did you mistakenly mark the wrong letter on the scantron?

Project impact on exam grades

Grade distribution of each exam show changes through the semester. The shift between exams 1 and 2 is possibly due to the active progress of students working on their projects.

Not shown here are trends in the grades of individual students. Students who were most active in lab with classmates, who came to office hours and who improved on their projects through the semester earned increasing exam grades through the semester. One student improved her grades from 64% to 74% to 83.3%. There was a similar but opposite trend in grades of students who did their work as quickly as possible, left early, and did not participate in group work.



Results of Exam Wrappers

Before the Exam: Students are not spending enough time studying (especially in groups). You can monitor if their study time increases as the course progresses.

During the Exam: Hunger, anxiety, fatigue and personal issues are common. Students can change their eat/sleep patterns or be tested for test anxiety.

After the Exam: Many students indicate disappointment in their performance. Identifying these emotions can trigger a change in habits. On average, more than 1/2 of the answer changes result in going from the right answer to the wrong answer.

Overall Conclusion: Students are honest on exam wrappers whether anonymous or not. The mean grade students expect to receive before the exam is a 70. This number drops several points during the exam and even further at the conclusion.

Summary

Varied assessments help students learn better. Reduced weight of multiple choice exams puts less pressure on students. Qualitative feedback from students indicated that preparing individual pages for the project required them to consider the information presented in lecture and lab in a different light than they usually digested information which many claimed helped them on exams.

Alternate assessments may help to show student learning in ways that a single type of assessment does not.

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