Addressing tricky concepts through low stakes peer review exercises

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What is a tricky concept?

“Because learning involves transfer from previous experiences, one’s existing knowledge can also make it difficult to learn new information. A problematic situation occurs when people construct a coherent (for them) representation of information while deeply misunderstanding the new information. Under these conditions, the learner doesn’t realize that he or she is failing to understand.” How People Learn, 70.

"The concept that students often mix up on the exam."
Why does writing about a concept help?

“When a subject is taught in multiple contexts, . . . and includes examples that demonstrate wide application of what is being taught, people are more likely to abstract the relevant features of concepts and to develop a flexible representation of knowledge” (Gick and Holyoak, 1983). How People Learn, 62

Writing helps students clarify the differences between two concepts students often mix up.
Why low stakes? And how to do?

• Could be done in class for no-credit

• Can be done for review completion credit (outside of class)
  • Points awarded for completing the review, not writing the answer
  • Points awarded for writing assignment and for reviewing peer writing, not for the correct answer
  • Points go towards participation, or homework, or....

• There is no grading of the student’s answers
What are the benefits of peer review?

**Increased Comprehension**
- Can show errors in thinking/answer before exams
- Allows students to work with a “rubric” and see your expectations for a quality answer (before an exam)

**Builds problem solving skills**
- Allows students to see how others answered the same questions (and their thought process)

**Exposure to subject-specific writing**
- Students to see other writing styles
Examples of Peer Review Exercises: Evolution

This example is a tricky concept that is fundamental to biology. This should be review from the first year courses but most students still struggle with it.

As we have been discussing in class, two major mechanisms of evolution are natural selection and genetic drift. In your own words (as if you were explaining this to a friend who is struggling in the class) explain the similarities and differences between these two mechanisms.

Make sure that you answer includes the following:
(1) clear definitions of both natural selection and genetic drift
(2) how each of these mechanisms act to cause evolution in populations
(3) whether the outcome of each mechanism is predictable
(4) under what circumstances each would have a large or small effect
Examples of Peer Review Exercise: Genetics

This example focuses on a tricky concept that students often miss on exams. It is meant to get students to think through the why (relationship between certain types of inheritance processes and resulting offspring) as opposed memorizing how to solve the problem.

Your classmate has told you that just looking at the numbers of progeny from a cross can tell you if there is epistasis involved. They then give the following example:

In sheep, there are several different coat colors, a brown coat, an off-white coat, and a tan coat which is in between brown and off-white. Brown sheep crossed to brown sheep always yield only brown sheep. Off-white sheep crossed to off-white sheep yield only off-white sheep. Tan sheep crossed with tan sheep always yield a mix of brown, tan, and off-white sheep.

Two sheep with tan coats are crossed and their offspring are as follows:

- 23 tan coat
- 10 brown coat
- 9 off-white coat

But you know their example is wrong. Write a response to your classmate explaining how to determine what type of genetic inheritance is occurring and why. Be sure to reference all calculations and ratios associated with the progeny necessary to answer the question.
Examples of Peer Review Exercise: Video example in Evolution

This is an example in which students are asked to watch a brief video, make observations, and interpret their observations in light of theory covered in class lectures, readings, and discussion.

You are watching the video of the bird of paradise mating dance (in the homework folder) when one of your family members walks into the room. After watching the video in amazement (because really, who wouldn’t) they ask you several questions:

• Why does the bird do that?
• Why don’t the females dance as well?
• Why do the females like it---how could it possibly help them choose a mate?
• After you explain (in your own words) they ask you “Doesn’t that attract attention from predators, too? What about survival of the fittest?”
Examples of Peer Review Exercise: Review Article example for Disease Ecology

This example is based on a review article that students are assigned based on the ecology and evolution of zoonotic diseases.

There are many barriers that a pathogen has to overcome in order to spillover from the reservoir host population to humans.

In your own words, explain what each barrier is, why it matters (define it clearly in everyday language), how it relates to the reservoir, the spillover host (humans, for example) or the environment.

- Infection intensity
- Pathogen prevalence in reservoir host
- Pathogen survival
- Pathogen spread
- Reservoir host distribution
- Reservoir host density
- Spillover host exposure
- Spillover host susceptibility
Mock Peer Review Exercise

• Answer the prompt on your own (1-2 minutes)
• Randomly put in breakout room and answer as a group on one drive document according to your group number, link in chat (4-5 minutes)
• Look for message in chat window about starting the “review” process
• Navigate to the top of the one drive doc to see which group to review and the rubric
• Copy and paste rubric to review another group (3-4 minutes)
• Look for message in chat to return to your answer and see the review (2-3 minutes)
• Return to main session (leave breakout room button)
For you to try on your own (1-2 minutes)

Please answer the following prompt:

At freshman orientation new students are told of the many ways to get from East campus to classes on North and South. A disagreement breaks out about the fastest and safest way to get around. Taking into consideration traffic patterns, ecologically friendly modes of transportation and safety at all hours, propose the optimal method a freshman should consider to ensure a timely arrival to class.
For you to try in a group (4-5 minutes)- don't identify yourself by name

Please answer the following prompt:

At freshman orientation new students are told of the many ways to get from East campus to classes on North and South. A disagreement breaks out about the fastest and safest way to get around. Taking into consideration traffic patterns, ecologically friendly modes of transportation and safety at all hours, propose the optimal method a freshman should consider to ensure a timely arrival to class.
Reviewing another group (5 word minimum)

• How did the author address how traffic affects getting around campus?
• What safety considerations did the author find important?
• Did the author do a good job considering ecologically friendly modes of transportation? (Y/N)
• How much do you agree with their choice for transportation? (1= do not agree, 5 = agree)
• What did the author do that you liked?

• What do you think the author should consider to make their answer more complete?
Recap

• You thought of an answer to a question
  • this could be similar to an exam question or a concept that a student should master before an exam

• You put it in writing

• You “graded” a peer's work

• You and your peer review your “grade” and can now learn from your mistakes without being penalized
To do in Blackboard

**Step 1:**
- Test
- Survey
- Assignment
- Self and Peer Assessment
- Turnitin Direct Assignment
- McGraw-Hill Assignment

**Step 2:**
- Day assignment open
- Day writing is due
- Day grades “could appear”

**Due date and post date the same is helpful**
To do in Blackboard

**Step 2 continued: “the details”**

**Step 3: find gear icon, Launch Peermark manager**
To do in Blackboard

Step 4: New pop-up window, add assignment

Step 5: points are for review, date should be after the due date time, review is usually 4-7 days

*Save & continue is crucial step here!
To do in Blackboard

Step 6: Additional Settings

Step 7: Time to input rubric

*Save & continue is crucial step here!
To do in Blackboard

**Step 7: Rubric questions**

Click on the Add Question button to begin adding questions to the PeerMark assignment.

**Step 7: input rubric in order**

Questions can not be added once the PeerMark assignment is active.

- How did the author calculate the progeny ratios?
  - **Question type:** Free Response
  - **Minimum answer length:** 5

- Did the author calculate the progeny ratios correctly? Y/N
  - **Question type:** Scale
  - **Highest:** no
  - **Lowest:** yes

- Based on the author's ratios what type of genetic inheritance do they believe is occurring?
  - **Question type:** Free Response
To do in Blackboard

**Step 8: Checking the reviews**
To do in Blackboard

Step 8: Checking the SUBMITTED reviews

- *not meeting the word limit (but still having a good answer) may give a low progress and therefore less points*
Student Instructions:
Big thanks to Mac Wishart!!

Quick Student Guide to Turnitin Peer Review.

Once the instructor makes the peer review portion of the assignment available, students can begin writing a peer review by selecting the Launch Turnitin PeerMark Review icon beneath the Tools heading of the submission inbox.

Select the Start Peer Review button on the right to begin reviewing a paper you have been assigned. Select view details to view any instructions your teacher provides.

PeerMark will open. All the free response and scale questions that need to be completed for the peer review are located on the right side of the PeerMark screen.
Questions?