

ADVANCED TEACHING TECHNIQUE TWO-STAGE EXAMS IN CLASS OR ONLINE

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ENHANCED LEARNING THROUGH TESTING

Typically, exams in a course are used to assess how much students have learned. What if instead, exams were viewed as a continuation of the learning process? Most students and instructors are accustomed to student exams being individually taken with no opportunity to revisit the exam afterward.

In two-stage exams (group exams), students take an individual exam (Stage 1), followed by a second exam students take as a group (Stage 2). When designed correctly, students learn significantly more from two-stage exams than the traditional individual exams without the group exam (Gilly and Clarkston, 2014).



BASIC SETUP

The basic setup of this testing system is to test students individually in an exam (Stage 1) and withhold detailed feedback so students are not aware of what they correctly or incorrectly answered. During Stage 2 (the group exam), the students will take an exam that is similar, but more challenging version of the individual exam. This setup of two similar exams with a lack of detailed feedback in the Stage 1 exam encourages the students to discuss the questions and answers in the Stage 2 group exam. When it is time to grade the exams, the students' Stage 1 individual exam score contributes greatly to each students' overall exam grade (>80%) whereas a smaller portion of the total points are determined by Stage 2 group exam grade (<20%).

STUDENT GAINS

Students at all performance levels appear to experience higher learning gains from two-stage exams than traditional individual exams. In a study by Gilly and Clarkston (2014), students were able to answer about 1/3 of their Stage 1 individual exam questions correctly during the Stage 2 group exam. A common assumption is that students perform better because they rely upon detailed feedback from the individual exam to collectively deduce the correct answers, but this is not likely since the two exams are similar, but unique exams. Gains are not present when students have a second individual exposure to the Stage 1 questions or when students take the group exam as a second individual exam. The most logical explanation for these gains is student discussion Stage 2. While instructors commonly conclude the two-stage exam favors the lowest performing students, there is evidence that lower, middle, and upper-performance students all benefit from this exam style (Gilly and Clarkston, 2014).

STUDENT IMPRESSIONS

When implemented correctly, instructors should anticipate a positive response from students, but there may be some exceptions to this. Grace Troupe, the instructor for online genetics (AGRO 215) at the University of Nebraska – Lincoln, has used the two-stage (group) exam in her course for several semesters and reports that students speak positively about the two-stage exam experience during course reviews. Other individuals have similarly reported positive reviews about the two-stage exam, such as by Rieger and Heiner (2014) where 76% of students had a positive review of a two-stage (group) exam in their physics course. Some of the most common positive comments about two-stage exams was that they enjoyed it, it benefited them, and they learned through discussion with others or hearing others explain their answers. About 10% of students had generally negative comments about the two-stage exam.



The negative aspects students identified largely were due to groups not working well together, perceived issues with fairness, and generally negative feelings (disliked, were frustrated, or felt less confident) toward the exam. Largely, it appears as though two-stage exams can be a positive experience for students when implemented correctly.

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DETAILED IMPLEMENTATION

It is possible to implement the group exam in an online course, though it will require students to work synchronously. Use the following recommended steps to set-up the online students for group exams:

1. **Plan the exams:** Set the dates for the stage 1 individual exam. Generally, this will be the window of time you would normally allow your students to take their individual exam. Decide on the day(s) and time(s) when you will offer the stage 2 group exam in which the students must be present/meet synchronously. It is recommended that you randomize the stage 2 groups. Groups should contain 4-5 students and should not be formed based on academic performance.
2. **Prepare the exams:** Create your stage 1 individual exam. Copy your individual exam as a starting point for stage 2 group exam and tweak the questions slightly in this exam. Each question should still require the same skills and knowledge to solve the question, but should require the use of new numbers or ask students to complete a slightly different task than they completed for exam 1.
3. **Prepare your students:** Share information with your students about the upcoming exam. For instance:
 - a. **Dates:** When each stage of the exam is available.
 - b. **Resources:** The resources students can use for each stage of their exam (typically they can use the same items in both exams).
 - c. **Length of exam:** How long the students have to complete the exam (typically shorter for the group exam since students have already worked through similar questions).
 - d. **Instructions:** Provide the instructions for the individual exams. Then provide students with additional instructions about the stage 2 exam including:
 - i. Students must download Zoom to their computer (<https://unl.zoom.us>) to virtually meet with their stage 2 group.
 - ii. Students must attend a group exam time synchronously (“live”). Students will NOT be taking their group exam in the DLC (UNL’s Digital Learning Center) or a proctored environment because of the nature of the exam. Either the students need to be tasked with finding a mutual time to complete the stage 2 exam or the instructor can facilitate this part of the planning.
 - iii. Consider sharing some information about the benefits of two-stage exams if this is their first experience with this type of exam.
4. **Exam time:** Administer the individual exams (stage 1).
 - a. When group exam time comes up, you will need to create and share a Zoom meeting with your students and, depending on how many students are taking the exam at one time, you may need to enable the “breakout room” function. Provide students guidelines for how to successfully work in a group (directions about watching for time, allowing everyone to speak, etc.). Make it clear to the students that only one student will complete the group exam on behalf of the group. The group exam should never be opened or completed by multiple students in the same group. The student who enters the exam online will need to share their screen with other students so the questions can be discussed.
 - b. Record which students you are asking to work with each other.
 - c. Send the students into their Zoom breakout rooms (if applicable) to start their exam.
 - d. Monitor the students to make sure they are focused on the exam.
5. **After the exam:** Use the list you created in step 4b to enter the grade earned by each group. Only one individual from each group will have a score in Canvas until you manually add the grade to the rest of the group. Currently, there are no Canvas functions to handle group exams automatically nor are there good options for making manual grading easier.

Gilley, Brett Hollis, and Bridgette Clarkston. Collaborative testing: Evidence of learning in a controlled in-class study of undergraduate students. *Journal of College Science Teaching* 43.3 (2014): 83-91.

Rieger, G. W., & Heiner, C. E. (2014). Examinations that support collaborative learning: The students' perspective. *Journal of College Science Teaching*, 43(4), 41-47.

