

Overview

Scratch-off quizzes offer faculty a way of verifying students' class preparation in a format that promotes learning. Students, working in teams, answer items in a short quiz. When the team reaches consensus on a response, a student scratches off the response's covering. If a star appears, the response is correct. Otherwise, the team continues to discuss the question and reach consensus on a second (and perhaps third) answer. Points are awarded based on how many tries were used and the results give the faculty member a measure of how well the students prepared and their readiness for the class' activities.

How They Work

Prepare

The instructor composes a short, multiple-choice quiz with up to four responses for each item.

Administer

The quiz can be given to individual students first, if desired. This may be done in the usual fashion.

The team test is administered by grouping the students, then handing out one answer form per team. Students are instructed to reach consensus on a response before scratching off its covering. If the team gets an item correct on the first try, it's worth four (4) points. If two tries are needed, the team gets two (2) points. A correct response on the third try yields one (1) point (assuming there are four choices). Students hand in the form as a team.

The image shows a scratch-off form titled "IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF-AT)". It includes fields for Name, Test #, Subject, and Total. Below these is a table with 8 rows and 4 columns labeled A, B, C, and D. Each cell contains a small square representing a scratch-off area. To the right of each row is a line for the score. The form is titled "SCRATCH-OFF COVERING TO EXPOSE ANSWER".

The scratch-off form as the quiz begins.

The image shows the same scratch-off form as above, but with the first row (item 1) completed. The 'D' column has a star symbol, and the score for item 1 is 4. The rest of the form is still blank.

A correct response on the first try.

The image shows the scratch-off form with the first two items completed. Item 1 has a star in the 'D' column and a score of 4. Item 2 has a star in the 'B' column and a score of 2. The rest of the form is still blank.

On the second item, two tries are needed.

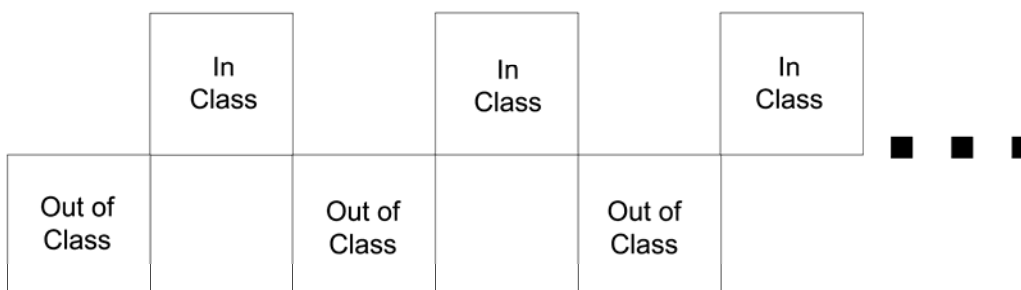
The image shows the completed scratch-off form with all 8 items scored. Item 1: 4 points (star in D). Item 2: 2 points (star in B). Item 3: 4 points (star in A). Item 4: 4 points (star in B). Item 5: 0 points (no star). Item 6: 2 points (star in B). Item 7: 4 points (star in B). Item 8: 4 points (star in B). The total score is 26.

Completed form with scoring.

How They Can Improve Learning

Expectation of Learning Outside of Class

When we design courses, we depend on students to do some learning outside of class. Often, this involves reading to acquire terminology or familiarity with concepts, theories or processes. Or, it may involve exercises that give students practice with a skill or process. Sometimes the out-of-class learning involves critical thinking tasks. Regardless of the kind of learning, the key point is that the out-of-class and in-class learning form a flow, with learning done out of class feeding into in-class learning which in turn feeds into learning outside of class. This flow is depicted below¹:



Including an activity like the scratch-off quiz communicates to the students that the out-of-class learning is important to their success and that you expect them to take the responsibility seriously.

Remediation on Unmet Out-of-Class Objectives

Even under the best of circumstances, some students in the class may have completed the assigned homework yet have not mastered the learning objectives you consider foundational to the session's activities. If you design quiz items so that they require the student to exhibit the skills defined in the objectives, many misconceptions can be cleared up through the combination of team discussion and immediate feedback. Students within the group will share their insights and students who may be too shy to admit difficulty in a large group may be more likely to seek help in the small group, especially if they know you expect them *all* to understand why an answer is correct. In the best of worlds, the remediation will be handled by the exercise itself; in the worst case, you will know there are students who haven't met the out-of-class objectives and you'll have a better idea of where they are having difficulties.

¹ This diagram is taken from *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses*, by Dee Fink. Published by Jossey-Bass, a John Wiley & Sons Imprint, San Francisco, CA, 2003.

Leveling the Field for In-Class Activities

There is probably no more vexing a problem for instructors than the heterogeneity of the students. Students come with widely different backgrounds, attitudes and goals. Their learning styles are almost assuredly distributed along the possible dimensions. Some are quiet while others will dominate if you let them. These differences and others make teaching for a group especially challenging.

In a well designed course, you can minimize some of the effects of these differences through careful sequencing of in-class and out-of-class activities. That is, you can define assignments that help students reach a given level of performance by class time. If you plan to have students design a data gathering exercise to support a management decision, for example, you may want their out-of-class learning to include their ability to define the appropriate statistical tools and their ability to compare and contrast them.

The scratch-off quizzes provide added assurance that the field is as level as it can be.

Other Benefits

In addition to the direct benefits to learning, research indicates that the scratch-off tests aid retention² and that students prefer the format over traditional, delayed-feedback tests and believe that the tests engender greater concentration and logical thinking.³

Best Practices

Constructing the Quiz

There are two important considerations when constructing the quiz. First, the quiz should have few items so the allotted time can be spent on discussion rather than reading and understanding the questions. Second, the items, although multiple choice, should assess as high thinking skills as possible and also illuminate likely student errors in order to encourage as deep a discussion among team members as possible.

Identifying Quiz Items

Ideally, the quiz will provide you and your students a measure of their success with the out-of-class preparation. Thus, it's best to have clear goals for that out-of-class learning. Start by listing these, striving to keep the list small (3-5 goals). If you have a larger list, look for objectives that you can group together. Keep trimming until you are satisfied that the goals state, as succinctly as possible,

² Epstein, M.L., Epstein B., and Brosovic, G.M. (2001). Immediate feedback during academic testing. *Psychology Reports*, 88, 889-894.

³ Epstein, M.L. and Brosovic, G.M. (2002). Students prefer the immediate feedback technique. *Psychological Reports*, 90, 1136-1138.

what you need the students to learn outside of class so that they will be ready to take advantage of the learning experiences you have planned for the classroom.

Next, check the wording in these statements. It's important that they describe something measurable. The easiest way to do this is to start each statement with the words "The student [verb]..." Avoid *any* use of the words "understand" or "know" – they're simply too imprecise and there's always a verb that can better describe the level of knowledge or understanding you expect:

The student will understand net present value.

versus

- *The student will be able to compute net present value.*
- *The student will be able to explain the role of net present value in forecasting.*
- *The student will identify situations where net present value applies.*
- *The student will evaluate assumptions underlying net present value calculations.*

All of these (and others) are possible interpretations of the first statement. Any of them are reasonable objectives, but one will best describe what you expect of your students within the context of the other class activities and the overall goals of your course.

Once you have the list of objectives finalized, you also have a list of question categories. That is, in most cases, you will want a quiz item that addresses each of the objectives. In some cases, particularly if you found yourself subsuming a number of other objectives from your initial draft under a particular objective in your final list, you may want to include a second question for that objective.

Composing Quiz Items

In addition to the standard guidelines for composing multiple choice items, the effectiveness of this exercise is enhanced if you do two things: create items that ask the student to do more than simply recall information and include distracters that will indicate expected errors by the student. If you do, the team's discussion will be much richer, the students will learn more from the exercise itself, and you can be more assured that your students are ready to fully engage in the session's activities.

As an example, consider this sample learning goal for the out-of-class work:

The student will correctly apply the concepts of price inflation, aggregate private demand, and tight monetary policy in the analysis of economic scenarios.

To assess success with this goal, it is not sufficient to merely ask definitions or even to ask a general compare/contrast question. A question that would encourage good team discussion and that gets at the analysis and application implied by the goal would be the following (adapted from Welsh, 1978⁴):

Because of rapidly rising national defense expenditures, it is anticipated that Country A will experience a price inflation unless measures are taken to restrict the growth of aggregate private demand. Specifically, the government is considering either (1) increasing personal income tax rates or (2) introducing a very tight monetary policy. If the government of Country A wishes to minimize the adverse effect of its anti-inflationary policies on economic growth, which one of the following policies should it use?

- a. The tight money policy because it restricts consumption expenditures more than investment.
- b. The tight money policy, since the tax increase would restrict consumption expenditures.
- c. The personal income tax increase since it restricts consumption expenditures more than investment.
- d. Either the tight money policy or the personal income tax rate increase since both depress investment equally.

With this question, you can imagine a rich team discussion where students, by explaining their choices, help each other clear up misunderstandings.

It's also helpful if the distracters, if chosen, reveal information about the students' difficulties. Experienced instructors will find this easy. It's simply a matter of remembering difficulties students had with the objective in the past and imagining answers that students exhibiting those difficulties would give. Faculty that are less familiar with the course or the kinds of students taking it may find it helpful to talk with an instructor who has more experience.

Minimizing the number of quiz items allows you to include more "essay" type multiple choice items that will better assess students' understanding and foster more in-depth discussion within the teams.

Conducting the Exercise

When you introduce the quiz activity to your students, it is a good idea to make two points very clear:

⁴ Welsh, A.L. (1978) Multiple choice objective tests. In P. Saunders, A.L. Welsh, & W.L. Hansen (Eds.), Resource manual for teacher training programs in Economics (pp 191-228). New York: Joint Council on Economic Education

1. Aside from checking their comprehension, the main purpose of the quiz is to make sure that they understand the outside-of-class material to the level necessary to take advantage of the class activities.
2. As the teams complete the quiz, *all* members must understand why a given response is correct.

These messages emphasize your expectation that students take responsibility for their learning and make their responsibilities explicit.

As the teams take the test, monitor the conversations for the following:

- Points that seem muddy across multiple teams
- Special insights
- Students who are not engaged or express confusion.

Resist the temptation to jump into the discussions. Instead, make note of what you see and hear to share via the follow-up (below) or even later in the class.

Follow-up

Remember that this activity is meant to assure a foundation for your class session, not a structure. Therefore, it is best to do minimal follow-up and instead reinforce your expectation for learning outside the class by initiating activities that move the students beyond the quiz' level. However, it can be good to spend a couple of minutes summing up the activity.

Quiz Items

While you should avoid simply running through all the quiz items, you can enforce the "all members must understand" rule by spot checking, perhaps asking students who looked less engaged *why* a certain answer is correct. If you noticed interesting discussions during the team test, you may also want to bring some of that out for the whole class. Keep it short, though.

Other Class Activities

Because the quiz assesses learning that is foundational to the class' activities, there should be plenty of opportunity to relate material and learning goals from the out-of-class work to the new goals of the class session. It's not necessary to make every connection explicit, but your students will likely find it helpful in situations where two or three of the outside-the-class learning goals are contributors to an in-class goal. Usually, this can be done with a short sentence like this:

In your preparation for today, you learned to compare and contrast various reward theories. Now, I'm going to ask you to analyze specific job situations and apply the theory you think best fits.

This will help the students integrate their preparatory and in-class learning and reinforce the importance of the out-of-class work.

Prepared but not Ready

Sometimes a student can complete the reading, exercises or other out-of-class assignment and still not be at an appropriate level of achievement to take advantage of the class' learning activities. You can recognize these students by observing the team discussions as well as through assignments that are turned in. You can support such students' learning in a number of ways.

First, if you feel that one or more of the students may be having profound difficulties, you can remind them of your availability outside of class. This gentle advisement that you recognize a problem, at the very least, reinforces that you have expectations for all students to learn.

Often, there are opportunities in the class to apply the out-of-class learning within a new context. Including the student who appeared shaky on the objective in explaining or performing, while you provide an appropriate level of guidance, may alleviate the difficulty.

In cases where you notice patterns across several semesters or sections, you might consider one or more of the following:

- Are the out-of-class objectives reasonable? If you do not feel your students are able to meet them, it's better to redefine them and adjust your class activities than to proceed with class activities you know will not be as effective as you'd like. If you think they can be met, you should look at modifying the set of out-of-class materials to better support the learning.
- Is there a particular aspect of the objective that seems most problematic? For example, students may confuse two concepts like *speed* (the rate of motion) and *velocity* (a measure of speed and direction) if the preparatory materials did not encourage them to compare and contrast the concepts. In cases like these, simply changing or adding an assignment can clear up the difficulty.
- Does the pattern involve a particular kind of student (e.g., a non-Finance major)? In cases like these, it's helpful to have remedial or otherwise one-on-one resources available. These might be optional readings, tutorials or exercises. To be most effective, the resources should include a way for the student to verify his learning. Web-based, interactive materials can include self quizzes or other techniques to give the student this verification.

Office of Learning Excellence Resources

The Office of Learning Excellence (OLE) has a number of resources available to assist in your use of this technique.

First, we can supply you with the forms and answer key. Just let us know how many forms you need. If you plan to use them over multiple quizzes, we can

give you sets of forms with different placements of stars (i.e., item 1 could have a correct response of “A” on one set and “C” on another). If you plan to give short quizzes (five or so items) a number of times, you can cut the forms in half or fourths, thus multiplying the variety of start placement for the items across the quizzes. **To deter gaming, we ask that you do not leave the forms in the possession of students.**

If you would like assistance with writing learning outcomes, one of our instructional design staff can work with you to help translate what you think is important learning into a format that will provide you and your students better guidance. We also have an online guide, available at this URL:

<http://www.csom.umn.edu/Page4653.aspx> .

Likewise, our instructional design staff can work with you on composing quiz items that will assess your desired outcomes and with designing learning experiences to facilitate the students’ learning.

In the event that you want to look into providing additional, technology-based resources like web-based exercises, the OLE staff can help research material that is available and integrate available technologies.