Special
Report

**Online
Teaching
Strategies**

**Assessing Online
Learning: Strategies,
Challenges, and
Opportunities**

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Seven Assessment Challenges of Moving Your Course Online (and a Dozen+ Solutions)

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Not all online courses are created from scratch. Many—if not most—are online versions of courses that have previously been taught face-to-face. In these cases, where an instructor or instructional designer is adapting an existing face-to-face course for online delivery, assessments already exist.

But to be effective in an online environment, the assessments that worked perfectly fine in a face-to-face classroom may need to be tweaked or even replaced. Why? Because the online teaching and learning environment presents the following seven challenges to traditional assessment implementations:

1. Cheating is easier to do (and harder to detect) online. While it's not clear whether online students do, in fact, cheat more than face-to-face students (Watson & Sottile, 2010), the truth is that it is more difficult to monitor who's taking a test and how they're taking it online than it is in a classroom. Strategies for adapting assessments for online delivery include:

• *Timed/open book tests.* Online, every test is an open-book test (except those that are proctored). To minimize read-as-you-go test-taking, reduce the amount of time students have to take the test so that only those students familiar with the material can answer the questions in the time allotted.

Alternatively, replace selected response tests (such as multiple choice and T/F) with short-answer or essay questions that require students to apply textbook facts to novel scenarios.

• *Shuffled/randomized test questions.* Shuffling questions helps reduce the likelihood that two students sitting in adjacent library carrels can take the same test together, one answering the "odds" and the other answering the "evens." Selecting questions randomly from a large test bank takes this idea one step further, providing each student with a similar (but not identical) assessment. (Most learning management systems provide both shuffling and randomization capability.)

• *Plagiarism detection software.* Having students run their essays through a for-fee plagiarism detection service such as SafeAssign or TurnItIn can potentially deter cut-and-paste plagiarism. At the very least, it can start a conversation about how to cite sources properly.

• *Frequent low-stakes tests,* such as short quizzes or self-check activities worth no more than a few points each, help make cheating more trouble than it's worth.

• *Performance assessments.* Assignments that require students to write, speak, or present to the class are harder to fake—especially if they occur regularly throughout

the course.

• **Coordinated tests.** Instructors who teach multiple sections of the same class may want to coordinate tests so that all students take the same test at the same time. (Staggering tests increases the likelihood that the first students to take the test can pass on question details to their colleagues.)

• **Proctoring.** Requiring students to take proctored exams takes cheating off the table—or, at least, returns it to the same level as a face-to-face class.

2. Online courses need more student-to-student interactions "built in" than do face-to-face courses. In a classroom setting, students interact—socially (chatting before class starts) and as part of common classroom activities (asking questions for clarification, weighing in on impromptu discussions, etc.) Online, these opportunities to feel connected and learn from each other do not occur naturally; they must be carefully planned and managed. Assessments that incorporate student-to-student interactions—while not appropriate for every course—can play a powerful part in a course's overall communication strategy:

• **Peer-review.** Asking students to review their classmates' work (and grading them on their reviews) can help motivate best efforts as well as help students learn from each other.

• **Group projects.** Well-designed group projects help students master both course content and team participation skills.

3. Online students need more student-to-instructor interaction than their face-to-face counterparts. While instructor interaction and feedback is important to all students, it's critical to the success of online learners and—like student-to-student feedback—must be carefully planned and cultivated in an online setting. Fortunately,

online tools make incorporating student-to-instructor interaction into assessments relatively achievable via:

• **Frequent, low-stakes testing** ("self-check" quizzes and activities). Options range from short selected response quizzes and watch-and-discuss questions to complex games and activities accessed through textbook publishers' add-on course cartridges.

• **Rich, detailed feedback.** Strategies for providing rich, detailed feedback vary based on the activities you've selected for your online course. The most practical include building detailed feedback into selected response quizzes; actively managing discussion boards; and administering weekly surveys asking students to identify the concept(s) they're struggling with and then addressing the most-identified concept(s) by using a product such as Jing to create and post quick video clarifications.

4. Online students need more planned structure—that is, more help in staying on time and on task—than their face-to-face counterparts. The structure that occurs naturally when students and instructor congregate in the same place at the same time (seeing "Test next Tuesday" written on the white board, for example, or overhearing classmates a row over discussing an upcoming assignment) doesn't just "happen" in an online course; it must be planned and managed. These assessment-related techniques can help:

• **Frequent, low-stakes tests** (ungraded or low-point-value "self-checks") help students gauge for themselves how well they're mastering the material.

• **Graded milestones.** Breaking up large projects into smaller graded milestones helps students (and you) identify problems areas early enough to address them.

• **Graded participation.** Using a rubric to

grade discussion board participation is time-intensive, as is asking students to review each other's work. However, the benefits in terms of being able to gauge and guide students' understanding can often be worth the time investment.

5. Performance assessments (such as presentations and demonstrations) can be more challenging to administer online. Putting students "on the spot" in a classroom setting (by assigning them to demonstrate a process or deliver a speech to the entire class, for example) can strengthen their communication skills and help them learn from each other. Online, however, students need to be able to package their presentations so that their instructors and fellow students can view and provide feedback on them. Accomplishing this requires:

• *Low-cost/free hardware and software.* Webcams and microphones are relatively affordable, and—given clear, step-by-step instructions—students can use free software (such as Jing, Screencast-o-matic, or VoiceThread) to capture and distribute presentations. Students with access to iPads can use free/ low-cost online services such as Educreations and Explain Everything to create and submit handwritten assignments (useful for math proofs, for example).

• *Free Web conferencing services (optional).* With Google Hangouts, students can conduct synchronous presentations—useful for hosting live post-presentation Q&A sessions.

6. Students expect more visually rich and interactive materials delivered via screen than they do from an in-class experience. Face-to-face classes are inherently visual and interactive. In an online class, however, the amount and quality of visual and interactive materials can vary widely. To avoid turning an online class into an old-fashioned correspon-dence course ("read the textbook, take a multiple-choice quiz, and contact the instructor if you have questions"), online courses should incorporate as much rich, relevant multimedia as possible—including, where appropriate, interactive multimedia assessments such as:

• *Drag-and-drop activities.* Consider replacing one or two multiple-choice quizzes with a drag-and-drop quiz that requires students to order or categorize concepts visually.

• *Image-based activities.* For highly visual subjects such as art appreciation or biology, replace one or two multiple-choice quizzes with a series of images and require students to "click" their answers.

• *Audio-based activities.* Consider requiring students to take assessments by recording their answers in an audio-only mp3 file format.

7. Because an online course typically takes more time to teach than the same course taught face-to-face, containing instructor workload with regard to administering online assessments is important. When students and instructor are in the same place at the same time, giving verbal instructions and feedback is easy and natural. Online, much of the feedback instructors give must either be written (via discussion boards, for example), which takes longer to compose; or it must be mediated through technology. Rather than hand-grade a math assignment and simply hand it back in class, for example, an instructor must either locate and learn how to use tools to mark up the digital version of the assignment, or mark it up by hand, scan and digitize it, and send it back to the student. None of these steps is particularly difficult— but the extra minute or two, multiplied by the number of students and number of assess-ments, can add up quickly (to say nothing of the additional time the instructor must spend

teaching students how to hand in such assessments and dealing with the technical glitches that inevitably arise).

Strategies for containing the time required to provide feedback on assessments include:

• **Group projects.** Having small groups of students work together to write a paper, create a presentation, or produce some other product assessment reduces the number of assessments you'll need to grade.

• **Peer-reviewed activities.** Students post their work to a discussion board or a blog and then review two of their classmates' submissions. This strategy ensures all students receive valuable feedback while helping reduce the time the instructor must spend reviewing each submission.

• **Student-led discussions.** Artfully guiding multiple discussion boards containing dozens of student participants is time-consuming. For selected discussions, organize students into small groups and assign one student to manage and summarize each small-group discussion.

• **Representative submissions.** Using a multimedia tool such as Jing or VoiceThread to dissect, just as you would in the classroom, a few representative submissions (such as a research paper containing an ineffective conclusion and one that cites sources incorrectly) lets you address the most common problems efficiently, saving your remaining grading time for more personalized, in-depth student-to-student communications.

It's important to note that while implementation strategies differ in an online environment, the pedagogical strategies underlying assessments shouldn't change when you move a face-to-face course online. Online or off, assessments need to align with course objectives and provide a consistent measurement of student learning. If having students hand-write math proofs so that you can assess understanding and grant partial credit makes sense in a classroom, for example, chances are it makes sense online, too. The pedagogical strategy (hand-written homework) stays the same; only the implementation strategy (having students create and sending handwritten work as a digital file) needs to change.

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But What if They Cheat? Giving Non-Proctored Online Assessments

Sheryl Cornelius, EdD

As online education continues to grow, so does the potential for academic dishonesty. So how do you ensure your online students are not cheating on their tests? Bottom line, you don't. But there are ways to stack the deck in your favor.

many students from breaking the rules.

Second, do not set rules that you have no way to enforce, e.g. forbidding the use of books, notes, or other resources. Instead ask questions that will not be evident in the resources, such as items where students

"First, start by creating a culture of integrity...Second, do not set rules that you have no way to enforce...Third, make every assessment different."

The good news is it's not as bad as you think. A 2002 study by Grijalva, Kerkvliet, and Nowell it found that "academic dishonesty in a single online class is no more prevalent than in traditional classrooms" (Paullet, Chawdhry, Douglas & Pinchot, 2016, pg. 46). Although the offenders have become quite creative in their endeavors, the prevention remains the best defense.

First, start by creating a culture of integrity. Many institutions have students review the school's Honor Code and sign a "pledge." The first question on every exam I give is True/False, "I will follow the Honor Code while taking this assessment." It follows the similar rule that locked doors are for honest people, but it also serves as a good reminder of the possible consequences, which often is enough to keep

have to analyze, evaluate, and think critically about the content. Essay questions, case study analysis, fill in the blanks, sequencing questions, and hot spot questions are difficult to look up. It also helps to set a time limit for the test so that Googling answers becomes impossible.

Third, make every assessment different. No, I am not saying create 25 exams, but you can scramble questions and create multiple versions of the same test. If everyone finishes the exam with an essay question, you can create three different questions and have one randomly assigned to each exam. If you have deep enough test banks, you can have several different test versions with no question being repeated. Anything you can do to mix up the versions can detour efforts of deceitful activity.

Many instructors withhold feedback until the exam has closed. In this way no one can pass on answers to others. Some will have the exam synchronous for this very reason. However, making the exam synchronous takes away the flexibility for online students that work unusual shifts.

If you have the added budget, your school may want to invest in software that does not allow the student to travel off the page of the test. The downside of this is that students often have multiple devices so there is nothing preventing them from taking the assessment on their laptop and looking things up on their smartphone.

If you are really tech savvy, you can check time stamps for test takers and compare them to the IP address. If multiple students log on to the exam from the same IP address in a relatively short timeframe then it's probably safe to conclude they are having a test-taking party where they sit together in one location and ask each other for help.

In the end, we must balance the fact that we are teaching adults who deserve a level of trust. And for those students who have a licensure exam waiting for them at the conclusion of their studies, they're only hurting themselves.

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Informal Assessment Activities for Blended and Online Courses

Jonathan M. Dapra and Marcia A. Wratcher, PhD

Chances are you have a Learning Management System (LMS) like Blackboard, Canvas, D2L, or Moodle at your school. But how do you use it? The findings from a recent survey by Pomerantz, Brown, and Brooks (2018) of U.S. learning institutions are rather alarming. Despite the integration of an LMS in 99 percent of schools and universities, and adoption by 88 percent of faculty to support online or blended learning environments, the platform is most frequently used for largely administrative tasks. Instructors use a dropbox to collect assignments and often treat the LMS as a file repository for copies of slides used in class and to house the course syllabus. Some will make use of the announcements feature to centralize critical communication.

Regardless of the LMS being used, there is

a significant opportunity to move students from passive observers to active participants by leveraging tools both inside and outside the system. These engagement activities are particularly effective for informal assessments within blended and online classes. They can be quickly and easily adopted by faculty using a simple set of strategies honed from well-accepted methods and approaches to student-centered learning. Best of all, many tools and techniques for supporting increased engagement are free, easy-to-implement, and do not require a high degree of technical savvy.

> "*...there is a significant opportunity to move students from passive observers to active participants...*"

Informal assessment

Traditionally, assessment has been used as a means of evaluating student performance for a grade—you assess students' knowledge and/or skills and assign a grade based on the percentage of correct answers. This sets up a linear relationship: teach then assess. But assessment can be used as a teaching and learning tool. Learner-centered education integrates assessment into the entire learning process in both informal and formal ways. Such assessments are often brief, ungraded, and most often anonymous, providing useful "real-time" information. Informal assessments can be used at any point during the class: at the beginning to pre-assess, throughout the class to confirm understanding, or when the session ends, as exit tickets for post-assessment.

Quick and easy informal assessment activities

Some of the most common and easy-to-implement informal assessment activities are polling, word clouds, focused listing, postcards, elevator pitch, and how squared.

• ***Polling.*** Mobile apps are increasingly being used in place of traditional "clickers" to ask questions, poll students, assess general knowledge, and generate feedback. One popular example is PollEverywhere, a web-based survey and real-time feedback provider allowing students to interact through a smartphone app, text message, or a website. Most LMSs feature some version of online polling or interactive quizzing.

• ***Word Clouds.*** Word clouds are images composed of words associated with concepts, questions, or reactions sought by an instructor; they are fast, engaging, and can provide an emotional connection for students. Think of the powerful insights a facilitator gains by simply asking students to report a single word describing how they feel about their progress on a project? The more frequently a word appears, the larger it gets, which allows the instructor to address most pressing concerns and simultaneously confirm the positive feelings revealed. Similarly, word clouds can be used to support brainstorming (e.g., in a case discussion the instructor might ask: "what kinds of obstacles might we face if we made this choice?"). Wordle and TagCrowd are two popular choices for creating word clouds.

• ***Focused Listing.*** Focused listing can be used before, during, or after a lesson. This method helps you to gauge student learning and allows your students to monitor their own Select a topic or concept and describe it in a brief word or phrase as the heading for the focused list. Set a time limit or a limit on the number of items to be listed. Ask students to make a

list of words and phrases that are related to the heading. This engagement activity can be implemented on a whiteboard, using a polling system, or in a discussion thread.

• *Postcards.* To wrap up a lesson, ask students to write a postcard to a "pretend" student who may have missed class that day. Students will need to explain the key ideas and takeaways from the lesson. Think of a postcard…you have just a little space to write your thoughts, so whether written by hand or electronically, the notes should be brief and concise.

• *Elevator Pitch.* As a review activity, ask students to summarize main ideas or key topics in fewer than 60 seconds. A fun variation of this approach is to have students present to a classmate acting as a well-known personality or theorist who works in your discipline. After summarizing, students should identify why the famous person might find the idea significant. An elevator pitch can often be recorded using a native recording tool in your LMS. Students can also use their mobile device to record these brief pitches then upload to a dedicated discussion thread.

• *How Squared.* At the end of a lesson, module, or class, pose two questions to your students:

• "How does something you learned connect to what you already knew?"

•"How did it extend your thinking further?

Use a blank notecard in class and students can drop the card off in a box as they leave class. One could easily implement this through email or a discussion too. This brief exercise will provide you, the facilitator, with a rich assessment of the learning your students just experienced.

Guidelines for implementing engagement activities

If you want to increase student involvement, interest, and motivation within your blended and online classrooms, here are some guidelines for developing engagement activities.

• *Keep it simple.* Start with an easy and low stakes activity. This approach will enable students and you to gain a level of comfort, foster engagement, and provide an enjoyable learning experience.

• *Ensure the engagement activity aligns with the learning goal.* Select an engagement activity that will provide you with what you want to know and what you want students to gain from the activity.

• *Prepare students for the activity.* Explain the purpose of the activity. Do not assume students will understand what you are doing and why, especially if they are accustomed to being in a traditional learning environment. Tell them what you have learned from the outcome of the activity and/or assessment when previously used.

• *Design your own engagement activity.* You may want to design an activity that fits the specific needs of your If you do design an engagement activity, ask a few colleagues to try a "dry run" with you so that you know it works and will achieve the purpose.

• *Change engagement activities throughout the course.* Do not use the same engagement activities all of the time. Switch up and try different activities for different purposes. If you use the same activities consistently, you may run the risk of student disengagement. There is an element of entertainment and interest generation within the practice of engagement—you don't want to be a one-trick pony!

• Informal assessments should be ungraded and anonymous. The purpose of these assessments is to solicit and provide feedback as well as to assist students with self-assessment and self-regulation of learning. Assure students these assessments are ungraded and anonymous, so they do not feel anxious and they are genuine in their responses.

• Explore free apps and LMS-specific features, and then test them before using in class. A sundry of open-source and free-for-academic-use software is available to allow for interactivity and real-time collaboration in the blended classroom.

• Talk to colleagues. Share your experiences with colleagues and inquire about what they have implemented. Sometimes an activity another faculty member has used can be adapted for your

Whatever the tool or medium (online, through a real-time polling system, or traditional pen and paper) engagement activities are powerful ways to enhance learning in face-to-face, blended, and fully online classrooms

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Reflecting on Effective Teaching Strategies: Faculty Share Their Successes

Samantha Clifford

To help direct students in their learning during the pandemic, we as faculty have been tasked with harnessing a range of digital technologies. Acquiring these additional skills has been easier for some, more challenging for others. Faculty at Northern Arizona University, where I teach, moved to a remote and synchronous teaching environment last fall. Below are student engagement strategies shared by faculty who were able to reflect on their successes with remote teaching. These include engagement strategies for synchronous and asynchronous learning, ideas for managing the class in the synchronous and remote learning environments and ensuring instructor presence.

Engagement strategies for synchronous sessions

• "Ask a question and have everyone type their answer in chat BUT NOT HIT ENTER. Then give them a countdown and have everyone hit enter at once. If you download the chat, this can be used to assess participation or attendance in the session."—John Tingerthal, Construction Management

• "Each week I have five students do 'My Favorite Movie'. They present a clip or a trailer, then talk about why they chose the film and

give the class a chance to discuss it. This works best when they simply post the link in chat. Very enjoyable and informative."—Paul Helford, Communication

• "A think-pair-share question is asked with a polling tool. Depending on the results, I decide if the 'pair-share' is necessary. I usually say something like, 'We have a range of answers, so you will work in break out rooms to convince your group.' After a set time, we vote again and hopefully converge on the correct answer. If convergence is not achieved, I will explain why one of the answers is false and then have them discuss again for a minute or so to determine the correct one."—Edwin Anderson, Astronomy and Planetary Science

Participation ideas for asynchronous learning

• "Homework questions are answered in a Google Chat room and graded as 'participation.' Students are required to ask at least one question per week either in Chat or the LMS virtual classroom. They self-report how often they participate, but I remind them to be honest because I have the records."—Robin Tuchscherer, Civil Engineering, Construction Management, and Environmental Engineering

• "I hide digital 'Easter eggs' in my materials. For example, in a prerecorded lecture video I show a random link for a few seconds to a Google form where they can enter their name, get a code, and get extra credit by entering that code into the LMS. I hide a link to another in my syllabus. A few times a semester I drop a link for them into the comments field when grading to see who's actually reading the comments. I call these 'curiosities' because my primary aim is for students to practice being more curious, but on a practical level they also help keep students engaged."—Curtis Smith, Boundaryless

• "Students are placed into breakout rooms in the LMS and then use a link to a shared Google Slide workspace to draw what their education would have looked like if the No Child Left Behind federal mandate was not in place during their K–12 educational experience. They are able to connect the course materials with their personal experience and have an alternative to a text-based group assignment."—Samantha Clifford, Anthropology

• "A guided notes outline is provided to students before class via the LMS. There are missing words and details where students respond, process, or apply concepts while following as they watch the recording of a short lecture. There is a Q&A section (built into the LMS) where these students can post, share, and ask questions; we go over these questions in the synchronous meeting."—Holly Aungst, Health Sciences

Managing class in the synchronous and remote learning environment

• "Research teams are created at the start of the semester. One person from each team is required to attend in person and log into the LMS virtual classroom as well. The other team members work with the in-person student in break out groups in class. Having someone physically in the class to raise their hand when they have a question makes it easier for them to get my attention and ask questions and hear the (sometimes long) answers."—Lisa Tichavsky, Criminology and Criminal Justice

• "I assign a student as a technology assistant each day. They monitor the chat to let me know if there are questions that I am missing. I found that when all students were remote, I could manage, but as soon as I needed to divide my attention with in-person students, I was missing questions. Students are sheepish

about interrupting and tend to ask their questions via chat. Having a student whose job is to interrupt helps me make sure I am not moving on while there are still questions."—Rachel Neville, Math and Statistics

Ensuring instructor presence

• "I log into Zoom on two different computers at the same time for each of my classes so that the students can see the material from one computer's camera, me from the other computer's camera, and the students in the classroom from the room camera. Multiple students have told me that they really like being able to see me and the material; it helps them to better connect with the class and the content."—Melissa Schonauer, Honors

• "I send a P.S. email that summarizes the day's activities and reiterates assignments. At the end of these emails, I 'invite' students to attend the next class and ask them to RSVP. This also provides them with an opportunity to ask clarifying questions about current subjects we are exploring."—Lawrence Lenhart, English

While all these strategies focus on fostering engagement and maintaining motivation, some of the most powerful endeavors entail reaching out to students who are struggling with the new learning format. As an instructional designer, I am witness to the incredible effort faculty are investing in their intentional preparation, transition to accessible content, and altering their assessments to be more authentic. Students notice and appreciate the effort. Please keep in mind that this effort can serve as a model for work expected in the course, in addition to highlighting your concern for your students' success.

Four Typical Online Learning Assessment Mistakes

Patti Shank, PhD, CPT

The goal of learning assessments should be to measure whether actual learning outcomes match desired learning outcomes. Here's an analogy. Your freezer stops keeping foods frozen, so you call the appliance repair folks. They show up on schedule and charge you exactly what they estimated on the phone. Is that enough information for you to know if the desired outcome (frozen food) has been achieved? No, of course not.

We use freezers to achieve specific outcomes. We build instruction to achieve specific outcomes as well. Well-written instructional objectives describe the desired outcomes of instruction and are critical to designing good courses and assessments.

A freezer that works means the food stays frozen as expected. Instruction that works means people learn as expected. Adequate learning assessments tell us whether the instruction we built works and provides us with data to adjust our efforts.

We measure whether instruction "works" by seeing if the instruction we build actually helps people achieve the learning objectives. I'd even argue that we cannot be considered

competent builders of instruction if we can't show that what we built helps learners learn. Some might say that's a big "duh," but I'm guessing a fair number of people who build instruction haven't really thought about it.

Here's a scenario for us to consider. Lana Mercer, a new instructor, has just finished teaching her online course, Introduction to Computer Graphics. Here are the three most critical terminal objectives for this course (these are reasonably well written, unlike most of the objectives I see, which makes it far easier to determine what assessments are needed):

• Analyze common uses for these computer graphics methods: 2-D representation and manipulation, 3-D representation and manipulation, animation, and image processing and manipulation.

• Describe methods for defining, modeling, and rendering of 2-D and 3-D objects.

• Determine the best tools to use for defining, modeling, and rendering of 2-D and 3-D objects.

Mercer graded students based on weekly homework assignments (10 percent of the grade), two projects (20 percent of the grade), and a final test (70 percent of the grade). More than a third of the students got a C or lower on the final and as a result, because the final was such a large percentage of the final grade, received low grades for the course. Lana didn't understand why students were upset, because final grade scores reflected a bell curve, so the range of grades was as she expected. See any assessment problems? (Yep, you should.)

Four typical mistakes

People who build instruction make some typical but unfortunate mistakes when designing learning assessments, and these mistakes compromise both their competence as designers of instruction and the quality of the instruction they build. These mistakes include:

1. Expecting a bell curve
2. The wrong type of assessment
3. Not valid (enough) assessments
4. Poorly written multiple-choice tests

Expecting a bell curve

Benjamin Bloom (1968), a distinguished educational psychologist, proposed that a bell curve model, with most students performing in the middle and a small percentage performing very well and very poorly (e.g., a normal or bell curve) is the wrong model of expected outcomes from most instruction. The bell curve model is what might be expected without instruction. Instruction should be specifically designed to provide the instruction, practice, feedback, and remediation needed to bring about achievement of the desired outcomes. His "mastery" model assumes that most students will be high achievers and that the instruction needs to be fixed if this does not occur.

Mercer should not have expected her students' final grades to fall on a bell curve. A mastery model assumes that most students will achieve the desired outcomes, and therefore, most will achieve higher grades.

The wrong type of assessment

There are two primary learning assessment formats: performance assessments and "test" assessments. The former involves assessing performance in a more realistic way (in situations), and the second involves paper or computer-based forms with multiple choice, matching, fill-in-the-blank, and short- and long-answer type (i.e., essay) questions. Test assessments are by their nature a less authentic way of assessing learning but are

very practical and are therefore commonly used.

The optimal assessment type depends primarily on whether the objective is declarative (facts: name, list, state, match, describe, explain…) or procedural (task: calculate, formulate, build, drive, assemble, determine…). Research shows that there is a big difference between these two types—the difference between knowing about and knowing how (practical application to real-world tasks).

Let's take, for example, a biomedical technology course. A biomedical technician needs to know the names of a cardiac monitor's parts (declarative objective) in order to find applicable information in the trouble-shooting manual. But knowing part names only goes so far. Knowing how to troubleshoot the cardiac monitor (procedural objective) involves far deeper skills. So, asking biomedical technicians to name parts or even list the trouble-shooting steps on a final test is an inadequate assessment of their troubleshooting skills. The bottom line is whether they can, in fact, troubleshoot, and that requires a performance assessment.

When it comes to designing adequate assessments, it's inadequate to determine only whether learners know about if you need to determine whether they actually can perform

in the real world. Many higher education instructors don't adequately infuse their courses with real-world implications and skills, and I believe this is a mistake.

Mercer's objectives are a mix of declarative and procedural, but her assessment scheme is heavily weighted toward achievement of declarative objectives (and the tests used to assess them). That made her grading scheme unbalanced and inappropriate. A more balanced and appropriate grading scheme would have given more weight to projects that show achievement of procedural objectives.

Not valid (enough) assessments

The gold standard for assessment quality is validity. A valid assessment measures what it claims to measure. For example, a biomedical equipment troubleshooting assessment should measure the skills of the person doing actual or simulated troubleshooting. It's easier than you might think to design assessments that measure something other than what is intended.

Let's say the biomedical equipment troubleshooting assessment primarily asks students to match parts, functions, and typical problems. Is this a valid assessment of trouble-shooting skills? Unlikely. And what if another assessment is written at too high a reading level. What is it measuring? For one thing, reading skills. Both tests are likely less valid than is necessary. The best way to establish validity is to carefully match objectives and assessments, as explained in the last mistake.

Lack of validity impacts course quality and fairness. And if the results of assessments impacts passing the course (as they usually do), invalid assessments are not only unfair but potentially illegal.

Objectives and assessments in Mercer's class didn't match up. Because students in Mercer's

class needed a passing grade in order to take higher-level graphics courses, she needs to rethink the validity of her assessments, starting with mapping assessment types to objective types.

Poorly written multiple-choice tests

Many assessments, even if they are the right kind, are poorly written. Two of the most common mistakes for multiple-choice questions are confusing or ambiguous

Computer Graphics course suffered from all the mistakes listed, even though the instructor was well-intentioned. In an online course, where students often require extra feedback and motivation, unintended frustrations and unfairness can cause many problems including complaints, reduced enrollments, and lack of persistence.

Writing good performance assessments and test questions is a skill that takes training, time, and feedback.

"Writing good performance assessments and test questions is a skill that takes training, time, and feedback."

language and implausible distractors (wrong alternatives from which the learner selects the correct answer[s]). A poorly written multiple-choice question automatically lowers the validity of the assessment.

Final thoughts

Inadequate learning assessments are at best frustrating. At worst, they can damage students and institutions. Adequate learning assessments are one of the hallmarks of competence in building good instruction and markedly improve the quality of instruction.

The final assessment for the Introduction to

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Unlocking the Promise of Digital Assessment

Stacey Newbern Dammann, EdD, and Josh DeSantis

For many professors, student assessment is one of the most labor-intensive components of teaching a class. Items must be prepared, rubrics created, and instructions written. The work continues as the tests are scored, papers read, and comments shared. Performing authentic and meaningful student assessment takes time. Consequently, some professors construct relatively few assessments for their courses.

Unfortunately, this practice limits professors' ability to reliably assess student learning. If a course grade is a mosaic, then each assessment is a tile. A mosaic with just a few tiles only presents a part of the picture. Professors can improve the quality of their assessment mosaic by increasing the number of performances they assess. These smaller and more frequently administered snapshots of student learning are frequently termed formative assessments. The integration of frequent formative assessments improves the validity of course assessment and has been demonstrated to have a variety of benefits, including improving student achievement and helping students develop more agency over their own learning (Nicol & Macfarlane-Dick, 2006). By providing more numerous and

> *"If a course grade is a mosaic, then each assessment is a tile."*

authentic measurements of student thinking, professors can improve the fidelity of their assessment mosaic and the reliability of their assessments of student learning.

The proliferation of mobile devices and the adoption of learning applications in higher education simplifies formative assessment. Professors can, for example, quickly create a multi-modal performance that requires students to write, draw, read, and watch video within the same assessment. Other tools allow for automatic grade responses, question-embedded documents, and video-based discussion. In addition to simplifying formative assessment, the use of these tools has been shown to amplify student engagement (Hwang & Chang, 2011).

Emerging tools and approaches open new opportunities for professors to gather more frequent and more authentic formative assessment data. This, in turn, can help students learn the course material and can help professors to tailor their instruction to meet the needs of their students.

Formative Assessment Tools to Consider

There are hundreds of formative assessment tools available. Many, however, perform similar functions. You can narrow your search by considering what approach would work best in your teaching context then identifying a tool you can integrate into your practice. If you are a novice, start small and aim for a win. Choose a course for which you would like to improve the quality of your assessment then select one technology tool to get started with.

• **Multi-Modal Assessments** – Several applications allow professors to create multiple-choice and open-ended items that are distributed digitally and assessed automatically. Student responses can be viewed instantaneously and downloaded to a spreadsheet for later use. Examples of these tools include Socrative and Poll Everywhere. Some tools in this category have unique capabilities. Formative allows professors to upload charts or graphic organizers that students can draw on with a stylus. Formative also allows professors to upload document "worksheets" which can then be augmented with multiple-choice and open-ended questions. Nearpod allows professors to upload their digital presentations and create digital quizzes to accompany them. Nearpod also allows professors to share three-dimensional field trips and models to help communicate ideas.

• **Video-Based Assessments** – Question-embedded videos are an outstanding way to improve student engagement in blended or flipped instructional contexts. Professors may upload their own videos and screen-capture files or use pre-existing streaming video from YouTube. Once uploaded, videos may be embedded with multiple-choice or short answer items. Using these tools allows professors to identify if the videos they use or create are being viewed by students. EdPuzzle and Playposit are two leaders in this application category. A second type of video-based assessment allows professors to sustain discussion-board like conversation with brief videos. Flipgrid, for example, allows professors to posit a video question to which students may respond with their own video responses.

• **Quizzing Assessments** – Finally, tools that utilize close-ended questions that provide a quick check of student understanding are also available. Quizizz and Kahoot are relatively quick and convenient to use as a wrap up to instruction or a review of concepts taught. Quizizz works on any device with a browser and features specific apps for iOS and Chrome. Kahoot also has specific apps for iOS, Android, and Windows devices. Kahoot now features a team function and the ability to adjust the time limit for questions. Themes, memes, and avatars are available to choose so professors need only focus on the content of the assessment. Ten to 20 questions are easily administered in both tools; although longer assessments tend to lessen student engagement. Both multiple choice and true/false question format work well with either tool. These provide a fast-paced formative assessment that can address fact-based knowledge as well as higher order thinking.

Considerations

It is important to ensure that your integration of technology is aligned to sound formative assessment design. Formative assessment is most valuable when it addresses student understanding, progress toward competencies or standards, and indicates concepts that need further attention for mastery. Additionally, formative assessment provides the instructor with valuable information on gaps in their students' learning which can imply instruc-

tional changes or additional coverage of key concepts. The use of tech tools can make the creation, administration, and grading of formative assessment more efficient and can enhance reliability of assessments when used consistently in the classroom. Selecting one that effectively addresses your assessment needs and enhances your teaching style is critical. Moreover, it is important that you determine if the tools you select are compliant with your institution's accessibility and student privacy policies.

Using tech tools to support assessment can enhance the assessment mosaic of nearly every course. These tech-enhanced formative assessments produce actionable data that can help students learn more efficiently (Yorke, 2003). The design and function of the applications introduced in this article provide a starting point to enhancing your course assessment. The wide array of tech tools available allow professors to select one that match teaching styles and assessment needs. The promise of real-time assessment information and the convenience of collecting data digitally make emerging technologies a great place to advance your teaching practice.

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Creating Better Multiple-Choice Tests for Online Courses

Patti Shank, PhD, CPT

Multiple-choice tests are commonly used to assess achievement of learning objectives because they can be efficient. Despite their widespread use, they're often poorly designed. Poorly written multiple-choice tests are equally damaging in classroom-based and online courses, but in online courses learners often have to contend with more challenges, and poor assessments can add insult to injury.

Some plusses and minuses to multiple-choice tests

Multiple-choice tests can be developed for many different types of content and, if the test items are well written, can measure achievement of multiple levels of learning objectives, from simple recall and comprehension to more complex levels, such as ability to analyze a situation, apply principles, discriminate, interpret, judge relevance, select best solutions, and so on.

Multiple-choice tests are easy to administer and can be improved using item analysis in order to eliminate or correct poorly written items. They are easy to score and less susceptible to scoring subjectivity than short-answer or essay-type items. They don't measure writing ability (which can be a plus or minus) and often do assess reading ability (another potential plus or minus, but in reality, often a minus). They are more subject to guessing than many other types of learning assessments.

Multiple-choice tests are often promoted as "objective." Although scoring them doesn't involve subjectivity, humans do judge what questions to ask and how to ask them. These are very subjective decisions!

When multiple-choice is appropriate

Multiple-choice test items call for learners to select an answer or answers from a list of alternatives. Because they do not ask learners to construct an answer or actually perform, they tend to measure knowing about rather than knowing how.

Multiple-choice items cannot assess learners' ability to construct, build, or perform. They are best used for objectives that can be assessed by selecting the correct answer from a list of choices rather than supplying the answer or performing a task. Think for a moment about how different selecting is from constructing and performing and you'll recognize the limitations of multiple-choice testing.

Writing better multiple-choice items

Confusing and ambiguous language and poorly written or implausible distractors are very common errors when writing multiple-choice test items. Here's a to-do list to help you avoid these mistakes and write better multiple-choice test items.

• Provide clear directions. Group questions with the same directions together.

• Include as much of the question as possible in the stem and reduce wordiness of alternatives.

• Include words in the stem that would otherwise be repeated in each of the alternatives.

• Make sure language is precise, clear, and unambiguous. Include qualifiers as needed, but don't add unnecessary information or irrelevant sources of difficulty.

• Avoid highly technical language or jargon unless technical knowledge and jargon are part of the assessment.

• Avoid negatives and these words: always, often, frequently, never, none, rarely, and infrequently. When a negative is used, it should be CAPITALIZED, underlined, or bolded to call attention to it.

• Don't use double negatives or double-barreled questions (asking two things in one question).

Although it takes time and practice to write good items, this time and effort is well spent.

Using Self-Check Exercises to Assess Online Learning

Patti Shank, PhD, CPT

The intermediate statistics class I took quite a number of years ago had two types of learners at the outset—those who were worried about passing the course and those who were sure they couldn't pass it. The professor clearly understood the "fear-of-stats" phenomenon and used a number of instructional techniques to help learners gain confidence and skills.

One especially valuable technique was consistent use of self-check exercises. These were handed out at the end of each class along with an answer sheet. Class started each time with a question-and-answer period about the self-check exercises from the previous session. Doing the exercises was optional and they weren't handed in or graded, but nearly everyone did them, and the folks who did easily gained confidence and passed the course.

What are self-check exercises, exactly? They are problems (with answers) given to learners that allow them to assess how they are doing on an ongoing basis. Doing them online with self-grading provides immediate feedback. Links to additional materials can be provided to help anyone who is having difficulties. Online learners can do these exercises and submit questions they have, which the instructor can aggregate and respond to for the benefit of all learners.

Studies show that these types of activities help learners keep tabs on their progress and adjust their efforts, know when to seek help, and stay on track. These outcomes are especially important in online courses.

Some of the most important benefits of self-check exercises for online learning include

• Helping learners determine what they do and do not understand so they can target where extra study is needed;

• Providing immediate feedback to learners and an option to link to additional materials (which may reduce the number of unfocused questions sent to the instructor);

• Providing feedback to the instructor about where learners are having difficulties so immediate interventions can be implemented; and

• Increasing learner satisfaction with the instructor and the course.

Getting Started

Consider how self-check exercises can be used in the courses you teach. Are there concepts that learners consistently have problems understanding? Are there terms that learners need to memorize or concepts that they need to understand? These might be the best places to start.

Using Online Discussion Forums for Minute Papers

Debra Vredenburg–Rudy

Most of us are familiar with the informal assessment tool called the minute paper in which students write a short narrative about what they have learned about a particular topic covered in class. Many faculty use the minute paper at the end of a class period in order to gauge student understanding of the material. But there have been many successful modifications of the basic strategy. A number of them are reported in the well-known book Classroom Assessment Techniques by Tom Angelo and Pat Cross, who first proposed the technique.

I have used the minute-paper strategy previously and found it a useful assessment tool, so I decided to change the format and make the minute paper online and interactive. In my courses, I upload documents to the university's Blackboard website. One of the features of Blackboard is the communication link, which allows instructors to create online discussion boards where students can post comments and reply to other students' remarks. This feature presents the perfect opportunity to assess student learning via technology.

In a psychology research methods course, I used the minute paper during the last 15 minutes of a lab period. The lab portion of the course was held in a computer lab, which made Blackboard easily assessable to the students. At the completion of a lecture on identifying variables, I showed a video about the nonverbal signs of attraction during dating, a topic of interest to most college students. After the video and class discussion, students were required to post a comment on the discussion board and reply to a fellow classmate's remarks. I gave them the following instructions:

1) Describe what you learned today either from the video or class discussion;

2) Describe one thing that you found fascinating about human behavior; and

3) Reply to one of your classmate's comments.

To my pleasant surprise, students were so occupied with this exchange with their peers that I had to remind them that the period was about to end. Even students who were shy and unlikely to speak during class were now communicating with others who were less inhibited about speaking in public. I learned that an online minute paper not only serves as an assessment tool for student learning, it can be an effective means for stimulating classroom participation. The experience has renewed my respect for this simple but valuable feedback tool.

Rubric Options for an Online Class

John Orlando

Athletes are often "graded out" by their coaches after a game, and they always know ahead of time the exact criteria that will be used to grade them. An offensive lineman knows that he will be graded on the number of sacks allowed, missed blocks, etc. The clear performance criteria allow athletes to focus on meeting them.

The teacher has a clearer picture of what to look for. Plus, the rubric helps keep the instructor on track after doing a number of assignments. We all wonder about the "grading drift" that causes us to grade harder or easier as we get farther into a pile of assignments. Some instructors will even regrade an earlier assignment at the end to see whether they

"While the term 'teaching to the test' is often used pejoratively, it actually makes perfect sense."

Unfortunately, the same is not always true of higher education. As a graduate student, I was taught how to grade students down on essay assignments for various errors. But I was not taught to explain my grading methodology to students ahead of time, so many students' errors were a result of not knowing what I wanted.

Rubrics are an ideal way to clarify expectations for students. The assessment categories are clearly laid out and the different performance levels within each category demonstrate what constitutes good or bad performance. Rubrics provide students with models of what to do and what to avoid. This helps guide them in developing their work.

Rubrics also make the grading process easier by breaking it down into discrete items.

have drifted. Rubrics limit drift by tethering us to a standard.

But rubrics are also helpful in developing the assessment itself. Faculty normally consider assessments after determining their course content. But many educational theorists want faculty to reverse this process by first determining how students will be assessed, and then developing content that teaches to those assessments. While the term "teaching to the test" is often used pejoratively, it actually makes perfect sense. If the player will be assessed on how many sacks he gives up, then his training should focus on how not to give up sacks.

Starting with an assessment rubric also helps clarify in the instructor's mind what he or she wants students to learn, and thus what should

be taught. If critical thinking is an important part of the rubric, then the instructor needs to make sure that it is covered in the class. Too often students are graded on general skills like critical thinking without any explicate or related teaching, as if they were to acquire them by osmosis. It is a good exercise to sketch out in a rubric exactly what criteria will be used to grade students, and then compare it to your course content to see whether you cover all of those skills.

Rubric Software

While many faculty build their rubrics in an Excel or Word document, there are a number of free online systems that make the process much easier. These all function in similar ways. Each provides a template in which you define the performance categories as rows and levels of performance within each category as columns, and then fill in the boxes at each intersection of the two.

iRubric is a simple and powerful tool from RCampus. One nice feature of the site is that there is a gallery of over 485,000 rubrics made by other teachers that you can use or modify for your own purposes. I did a search on "digital storytelling" and came up with over 3,000 rubrics, and so there should be something for nearly any purpose. After creating your rubric, you can copy and paste it into a Word document as a table that you then copy onto a student's work. I like to highlight the boxes that correspond to the student's performance with a background color after copying the rubric into the assignment to make it clear what determined the student's grade. If you wish to pay for the premium version, you can enter students into the system and have your choices automatically calculated and graded. For tutorial see (https://youtu.be/JmNhEelN4o0).

OrangeSlice is a free Google Docs add-on that you can incorporate into your Chrome browser. You open a student's work in Docs, open the rubric, and highlight boxes. OrangeSlice will calculate the scores and provide the student with a grade. This is ideal for faculty having students submit their work in Google Drive.

QuickRubric is another simple yet powerful rubric-making tool. It works similarly to iRubric in that it provides a template with columns and rows to fill in. Unlike iRubric, it does not have a gallery of rubrics, but it does have a Tips to Writing a Strong Rubric page that can provide a good guide to getting started with rubrics. Plus, as a stand-alone system without a suite of non-rubric features, it presents a less cluttered page to work on if you are just interested in creating a rubric from scratch.

Try any of these rubric options to improve your grading and students' performance.

Small Online Teaching Strategies That Engage Students and Improve Learning

Flower Darby

This article is reprinted from The Best of the 2019 Teaching Professor Conference (© Magna Publications).

Online courses present unique challenges for both students and faculty. We've been teaching and learning in person for millennia, and we know a lot about how to do it well. The same is not true for online education. This modality has existed in its current form for only about 20 years. We're still learning what works. We're still getting familiar with what a good online classroom looks like—where the front of the room is, where the desks are, and where the light switch is. Indeed, many students and faculty today are relatively inexperienced in online learning environments, especially considering that we've taught and learned in physical classrooms for years.

And yet the demand for online classes continues to grow. Students who would otherwise be unable to attend college due to work and family obligations now have a way to pursue credentials and improve their lives. The flexibility afforded by online classes makes it easier for more people to earn a higher education than if the only option were to take classes on campus. We can improve our online teaching so that our students have a rich and rewarding learning experience—and we can do it one small step at a time.

Based on the approach James M. Lang and I outline in Small Teaching Online: Applying Learning Science in Online Classes (2019), which presents minor modifications to our classes to produce major learning gains, we'll explore eight practical, evidence-based strategies we can apply in our online classes— approaches that are neither overwhelming nor time-consuming, techniques that won't place an undue burden on our time. These strategies are organized according to four guiding principles that are especially relevant for online classes.

Tomorrow, next week, or next semester, consider making just one change to the way you set up or teach your online course. Because these strategies are grounded in research and intentionally applied, you'll likely find that this small change will have an outsize impact on student learning and engagement.

Surface backward design

Backward design is a method that helps us plan effective classes in all modalities. I like to compare this method to planning a road trip. First, we decide where we want to go. What is our destination? Similarly, where do we want

out students to wind up at the end of the semester? What do we want them to know and be able to do? Second, how will we know we've arrived at our desired location? What will our students do to demonstrate their learning at the end of the course, and what incremental signposts (assessments) are needed to ensure they're on track to reach their destination? Finally, what do we need for the trip? If we're heading to the beach, we need towels and beach chairs. If we're going hiking in the mountains, we need sturdy boots and trekking poles. In both cases, we'd do well to pack an ice chest with cool drinks and snacks for the drive. When planning our classes, we think about what our students need to succeed throughout the journey. What content and learning activities will help them successfully complete the final exam or project?

"*Rediscover why you love your subject, and make a deliberate effort to share that with your students.*"

Helping our students see the intentional design of an online class is especially important because we don't typically meet with them two or three times per week (like we do when teaching in person) to provide guidance and reminders and tie different concepts and learning activities together. To help your students see the purpose of online tasks and how each one helps them prepare for the final assessment, you can do the following:

• **Begin the final assessment in week 1.** Ask students to think about the final project, exam, or paper, and begin working on it right away. For example, have students submit a photo of a hand-drawn concept map with their initial ideas about the final project by the end of the first week.

• **Reflect on learning objectives.** In a well-designed class, all assessments and learning activities align with and support the course's learning objectives. Help your students think about what they're learning and why by asking them to reflect on class learning objectives in writing or by submitting an audio or video recording. Which objective do they think is most relevant for their goals? Which seems most daunting? Alternatively, have them respond to each one as they consider what they will learn in the course.

Harness the science of emotion

Emotion and cognition are inextricably linked, and emotions are powerful tools for grabbing and holding our attention (Cavanagh, 2016). We can put this power to work in online classes to better engage online students so they can learn more effectively.

• **Bring your passion.** Rediscover why you love your subject, and make a deliberate effort to share that with your students. Post news stories about current events related to your subject matter as they catch your attention. Tell your students why what they learn in your class will help them reach their academic, personal, and career goals. Communicate enthusiasm in your writing and voice recordings to capture and keep your online students' interest and attention.

• **Convey empathy and support.** Online students often do their coursework by themselves, and they often have competing demands on their time. Help them stay motivated to complete your course by being a cheerleader, a coach, or a mentor (whichever persona you prefer) in ways that extend beyond your content. Post encouraging announcements, point out how far students

have come, tell them you know they can do it. Small reassurances such as these can do a great deal to help students keep going throughout an often-isolating experience.

Design for persistence

Online courses have higher attrition rates than in-person classes. For students who are still developing time management and organization skills, the flexibility afforded by this format provides too much leeway. Let's help our students develop these attributes and make steady progress in our courses with activities such as these:

• **Assign a goals contract.** Have students sign a syllabus agreement that includes statements indicating that they understand course policies, their responsibilities as learners, and so on. Add a second component to prompt them to think through important related issues. Ask students to identify two goals for their learning in class, one action they will take to help them reach their goals (intentionally schedule time for coursework, for example), one challenge they anticipate, and one strategy they might use if that challenge arises.

• **Nudge selected students.** On day three of your accelerated online course, email each student who has not yet logged into class, encouraging them to do so. Alternatively, after the first exam, email each student who earned less than 70 percent, recommending online tutoring or similar support. Be strategic about your communication; give a little extra attention to those students who could use some additional help.

Help students make connections

As an expert in your discipline, you know exactly how concepts relate to and build on one other. Your students don't have that expertise. We can help them learn new material more effectively by helping them connect and organize new information for themselves.

• **Activate prior knowledge.** When we relate new information to what we already know, we retain it more deeply and can recall it more easily than when we learn new information with no context to guide our understanding. Create module pretests that ask students what they already know about that module's topic or help them think about their previous experience with these ideas. Pretests can be ungraded; set them as conditional release (most learning management systems allow you to do this) so that submitting the completed questionnaire unlocks the rest of the module's content.

• **Provide the framework.** Give students a skeletal outline or partial slides to take notes on while watching a mini-lecture video or doing the reading. Have them upload their document or a photo of it for points. Helping students organize new ideas helps novice learners retain information and begin to make connections between concepts.

Making small adjustments such as these can bring about big improvements in student engagement and learning in online courses. Don't try all of these at once; rather, pick one, try it, refine it, then add another. You—and your students—will be glad you did.

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The Faculty Focus newsletter is a free resource that publishes articles on effective teaching strategies for both the college classroom and online course.