Mastering & Modified Mastering: Methods to Mitigate Cheating

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Methods to Prevent Cheating

A common concern among professors using online homework systems is the fear that students will copy answers from one another and/or from online sources. Copying homework (as well as cheating on exams) has been a part of education since before computers or online programs existed. Despite the fact that there are students who copy, homework is still shown to be useful in student learning. Online programs do not prevent copying, but they lessen copying by:

- Providing content that is varied among students (randomized question content, different order of questions, Adaptive Follow-up assignments, and Dynamic Study Modules)
- Offering students guidance (hints and feedback) to help them with their homework.
- **New:** Encouraging students to use hints and feedback by removing any wrong answer penalties for hints and making hints more visible
- Giving instructors the ability to track student work.

How can you help students decide not to cheat?

Massachusetts Institute of Technology example

In a [Massachusetts Institute of Technology study](#), a group of educators investigated how copying homework affects students’ performance. They found that homework copying is associated with decreased learning. In an effort to remedy the copying, they implemented the changes below.

- Changed the instructional format from a lecture-recitation to a [technology-enabled active learning format](#) that encouraged collaboration. This [studio physics](#) increased and personalized interactions between instructors and students and let students help each other honestly.
- Showed students that repetitive homework copiers (those who copied >30% of their problems) scored progressively lower on all but one successive test over the semester.
- **Switched the grading policy** from pass/no record to A, B, C/no record based on suggestions in their student interviews that “copying would not affect my grade under pass or fail.”

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Suggestions to Mitigate Cheating

**Often the best prevention is low-tech and old-fashioned.** Help your students love the process of learning. Students are honest when the emphasis of the course is on learning rather than competition, when they feel the course is set up to help them learn. Teach students how to learn, to rise to challenges, and to accept struggle and failure as part of learning, and, studies say, your students will tend not to cheat.

**Talk to your students.** Explain the correlation of time-on-task and course success. Remind students that cheating on assignments only hurts them in the long run. Show them the [MIT study on copying](https://example.com) on the first day of class to show them that repetitive copiers score lower on exams.

**Assign tutorials, which dispel common misconceptions and include explanations and hints.** Tutorial questions are designed to teach students rather than test them.

**Successful learning environments address students’ fears:** that they will be judged rather than taught; that grades will determine their entire future; that they will have to make their entire way through the course alone. As far as you can, even in online courses, know your students and be sensitive to any special circumstances.

**Regular communication with instructors and fellow students helps students feel they’re in control.** Use social media. Consider allowing extra collaboration and cooperation in online courses. Studies have shown that students help each other learn and discover more sophisticated problem-solving strategies than any single student would discover alone. Group and team projects show the lowest incidence of cheating.

It can be argued that some forms of cheating, such as collaboration when the course doesn't permit it, are students' way of helping themselves learn more effectively. In a famous example at MIT in the 1990s, student programmers who weren't allowed to collaborate did so anyway—and became much more effective programmers. Collaboration is now the norm at MIT.

**Consider active learning approaches in your courses.** Have students read the material and listen to a video lecture beforehand. Then, use class time for critical thinking and peer instruction. Learning Catalytics within Mastering provides a way for you to ask open-ended questions that don't have a correct answer during class and group students based on their responses.
Both students and instructors can foster a culture of honesty. Instructors should be clear with students about why they consider certain behaviors unacceptable. If you can't explain why it's unacceptable, consider letting your students do it. For example, a UCLA professor of game theory decided to let his students cheat on the midterm, and gave them a week to decide how to cheat. The students all used game theory and learned.

When do students cheat?

It's unclear whether students cheat more in online classes than in blended or traditional ones. Some studies indicate that the level of student cheating hasn't changed much since the 1920s. It is known, though, that the Internet makes cheating easier, because all forms of information discovery and reuse are now easier.

Some “cheating” is the result of simple confusion. It's common, especially for international students, to have different ideas of what's allowed. Make your rules clear to everyone. Different rules often hold for tutorial assignments, assessments, and exams. Make clear why that is. Signing an honor code may or may not make a difference; knowing what the code is does.

In the MIT study on copying, they monitored copying by developing algorithms that gave a probability that a particular submitted solution had been copied. They also administered a dishonesty survey and conducted follow-up interviews with students. Overall, the educators at MIT found that “students are more likely to copy a problem if it is more difficult, if it is later in the assignment, if they do it closer to the deadline, or if the assignment is later in the term”.

They discovered that student copying grew rapidly in the first three weeks of the term, probably indicating increased academic load as well as time to form social networks that facilitate cheating. Student copying increased dramatically after the midterm exams as well. The student survey and interviews confirmed that copying was most likely due to time pressures that build over the term and are exacerbated by delaying the start of work until the day it is due.

How do students cheat?

- Students look up answers online by searching on the text of the question.
- One student buys access twice and uses the “phantom student” to fish for answers. The actual student then submits the correct answer.
Students share answers with friends or a group of friends.

To get extra time or undeserved credit, a student says that he or she has already submitted the assignment but “the computer lost it.” (Mastering records all standard assignment work once a student clicks the Submit button. In over 15 years of use, we have not found an example of Mastering “losing” work that has been submitted.)

Students hire other students to take either an entire course or, more often, only the quizzes and exams. Companies such as wetakeyourclass.com are built on this business.

What can you do within Mastering to discourage cheating?
The most effective way to discourage potential cheaters is to make it unprofitable.

Choose assignment content that minimizes cheating

- **Avoid multiple-choice items, which are relatively easy to cheat on** and which give students the impression that learning is simply a matter of finding (or guessing, or asking a friend for) the right answer.

- **Give students assignments rich in Mastering tutorial and coaching activities.** These kinds of publisher-provided content are specifically designed to help students learn. They break assignment items into simpler questions (hints), so students having difficulty can get help from the item itself. The feedback students receive from the system is often answer-specific.
  
  **New:** Use the “Items with feedback” filter in the Item Library to locate these items.

- **Use the default setting for hints** to encourage students to use them.
  
  **New:** By default, wrong answers in Mastering hints are not penalized. Let students know they can submit wrong answers on hints for free. You can change this setting, but our analysis has found that when students are not penalized for using hints, they open hints more often. They are more likely to submit more answers multiple times, until their answers are correct. They are more likely to submit answers for all assignment items.
  
  **New:** Hints are now displayed within the body of the item to make them even more visible to students.

- **Assign a variety of answer types:** labeling, matching/vocab, numeric/symbolic, ranking, simple text or essay, sorting, and so on. When
selecting content for assignments, use the item filters to find specific answer types quickly.

- **Select items that have randomized variables**, when available for your course. Look for the 🎓 icon to the left of the item name in the Item Library.
- **Pool the assignment and randomize the item sequence**. Do this from the Organize Content step of creating an assignment.
- **Choose personalized assignments**: These are the most difficult kinds of assignments to cheat on. Mastering provides two kinds of personalized assignments: Adaptive Follow-Up Assignments and Dynamic Study Modules. (Both options are available with many textbooks.)

**Use assignment settings**

- **Hints coaching**: Accept the default Assignment Presentation & Grading settings for the homework assignment category, especially for the display of hints. These settings are designed to reward honest work.
  - Remind students that wrong answers on hints are free.
  - Mention that, statistically, students who use hints when they need them get higher final grades. Mastering makes cheating unprofitable by making honesty more profitable.
  - If you find students are not using the hints, suggest their use.

- **Settings to prevent cheating**: The Assignment Grading and Presentation settings lets you:
  - Hide correct answers
  - Hide item titles
  - Randomize item sequence
  - Require a password
  - Pool items in an assignment
  - Set a time limit
  - Lock students out of a completed assignment until after its due date.

For more about this, refer to Mastering Security Features (video) and Create a Pooled Assignment (video). For best practices, review the assignment topics in the appropriate Implementation Guide.
Open the Simple Editor to add or edit questions

- Create your own randomized questions with the Simple Editor.
  - Use Variables to Vary Item Content (Online Help)
  - Add Variables to Randomize Questions (Video)
- Use the Simple Editor to change the wording of the problems enough that students would have a difficult time finding the solution online.
- Add questions to Mastering about material that you only covered in class. You can also import content into Mastering.

Manage your course

- Close course enrollment after your students are in. Once all expected students have signed up, go to Course Settings with Mastering or your Details area within Modified Mastering and close the course to prevent further enrollment (especially of potential phantom accounts used by cheaters).
- Add material from Mastering into your exams. If students know that content in Mastering will show up on their exams, they will pay more attention to it.
- If you assign pre-lecture assignments in Mastering, you don’t have to cover everything in class. Demonstrate how you adjust your teaching in reaction to the pre-lecture assignments and students will be motivated to take the assignments seriously and will find class time more useful.

Use Learning Catalytics for in-class activities and assessments

Below are some tips for using Learning Catalytics to promote peer instruction and active learning, which can encourage students.

- At the beginning of the semester, share the analysis (Scott Freeman, 2014) of how students in active learning courses do better than traditional lecture courses.
- Incorporate concepts and learning outcomes from your Learning Catalytics sessions into your exams and any other assignments to make the in-class experience a productive one for students.
- Try to connect what students work on in Learning Catalytics to their professional aspirations so they see the relevance and purpose.
- Consider using different kinds of active-learning activities. These may include knowledge questions, discussion questions, conceptual questions,
case studies, and data-driven problems. Learning Catalytics allows you to pose questions to students in the most natural and “authentic” way possible (avoiding multiple-choice format).

- **Use the Learning Catalytics seat map to identify students that may not be participating** during group activities. These students can be identified by the grey boxes (vs. green, red, or yellow which identify students who have submitted answers). You can also identify groups not on task this way. Then, encourage students not participating (by name) to consult with a student in the group that has correctly identified the correct answer.

- **Ask questions that address students’ misconceptions**. Use various question types such as region, sketch, ranking, word cloud, priority, many choice, data collection, and composite sketch.

- **Questions should challenge students appropriately** by being neither too easy, nor too hard. Somewhere between 30-70% of students should answer a question correctly on their own before discussion.

### More information to help you mitigate cheating

- **Mastering tracks all submitted student work**: When a student works on an assignment, every answer submitted, whether correct or incorrect, is immediately recorded in the Gradebook with the date and time of submission. Even if a student submits only a single incorrect answer in one part of a multi-part item, and then exits Mastering, the entry is recorded and viewable in the Gradebook. For that reason, it’s not possible for “the computer to lose” an entire test or assignment.

- **Get a User Activity Report from Support**: If more details are needed, a User Activity Report can be requested from Support that shows student login date and times, student answer submission dates and time, and details on what the student accessed while logged in. To request a User Activity Report for a specific assignment, contact Support.

- **Check low performing students at a glance**: Mastering’s gradebook allows you to quickly look for a student with a bright red row of low grades or zeros. Check your Mastering gradebook roster against the class list and suspend possible “phantom” students. For more details, see the next section on how you can use the Mastering Gradebook to find potentially questionable student behaviour.

- **Create a group within Mastering to check common patterns**: The group feature allows you to create a group for students you suspect may be
cheating together and examine their work as a whole to see whether suspicious patterns emerge.

- **Report answer sharing sites**: Pearson searches constantly for sites that post answers to questions and takes prompt action to shut them down. If you find such a site, please report it at [http://www.pearsoned.com/report-piracy/](http://www.pearsoned.com/report-piracy/) We also have a group effort to combat distribution of instructor manuals and test banks.

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**How can you use the Mastering Gradebook to find potentially questionable student behavior?**

- **Watch for students who are getting low grades in the first several weeks.** Mastering’s gradebook color-codes performance, making it easier to spot students who might be struggling. Intervene early to help them get back on track. It’s typically the lower-performing students who are tempted to cheat.

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- **Look at the time spent on an assignment.** You can check how long students spend on an assignment by displaying the Time tab or by exporting times or difficulty ratings.

- Once the assignment is due, **use the Diagnostics to display Student Scores alongside Student Time**, to see students who got high scores in a very short time. Compare student assignment times, low to high, with student assignment scores, high to low. A persistent pattern of high scores and low times has been associated with students who copy and may indicate students of interest.
• **Look for patterns of possible answer sharing.** From the Gradebook you can drill down to see a student's work on an individual assignment, including any item, item part, or individual answer. Examining the individual work of multiple students can reveal patterns of possible answer sharing. Time of submission can also be important.

• Also look for **differences between high student scores on homework and lower scores on a pop quiz** or offline assignments.

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**Additional training resources**

See the appropriate Mastering or Modified Mastering Instructor Help for more information.

**Mastering:**

[Mastering Instructor Help](#)

**Modified Mastering:**

[Modified Mastering Instructor Help](#)

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