

Writing On-Line Exam Questions that Discourage Dishonesty

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Abstract

How does an instructor create assessment tools which will promote individual student work within the on-line learning environment? What techniques will diminish the success of students who attempt to circumvent restrictions on information access? How can instructors limit the opportunities for students to cheat? This paper will focus on the design of assessment tools, papers, quizzes and exams, which are appropriate for the unique conditions and circumstances of the web-based learner. Areas of concentration include the assumptions that must be made when designing exam questions and other assessment instruments, suggestions for the construction of test questions and techniques for successful test administration. The paper will also explore indicators of successful assessment in the on-line environment.

Introduction

Typically, one of the first questions that an on-line educator receives is “How do you handle cheating?” After more than thirty course offerings over four years, the author replies, “Carefully!” There are many aspects of instructional security that can be explored and this paper addresses only one of them. All of the techniques to promote appropriate academic conduct are carefully interwoven. It is important to consider a multi-layered approach. Aside from testing security, on-line classes require other measures which include

- Behavioral objectives
- Deadline establishment
- Clearly identified expectations and policies for the particular class
- Superior communication between student and instructor (anonymity encourages dishonesty)
- Web-tracking tools to monitor student activities
- Identification of university policies and expectations for proper academic performance
- Enforcement of policies and procedures
- Outline of the benefits of the information available within this course (job, etc.)

Efforts must all work toward the accurate representation of student comprehension of the material. Combining techniques and procedures adds to the ability to ensure individual student work. However, in the same way that traditional classrooms differ in the success of promoting

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individual work, the on-line classroom will find varying degrees of achievement. One must recognize that natural variations in classroom performance will occur regardless of where the classroom is located.

Also critical in the design of assessment tools is the importance of “different types of samples of a student’s work [rather] than to base all the grades on a single type of assignment.”¹ This is also a key point in the creation of any learning environment which well serves its students, web-based or in any other format. As an instructor, it is important to “think outside the box,” to “provide a wide range of opportunities for the student to demonstrate the mastery of the same content or skill.”² Some examples of alternatives to traditional multiple choice exams include Power Point presentations, simulation projects using software, preparation of a sample policy or letter, or creation of a videotape. Other suggestions for assessment tools in on-line classes include statistical calculations of discussion board posts, conduct interviews of experts in the student’s location, research projects, on-line journals, and the development of a portfolio of electronic works.

Methods

In the television show “Who Wants to be a Millionaire” why is it not assumed that the “phone a friend” will always get the question correct? Would it not be in the player’s best interest to have the friend surrounded by reference books? Of course the designers of the questions at the game show know this and plan for it. Look at the design of the questions. Mainly, look at the amount of time provided to look up the information. Clearly these are limiting factors in the success of the lifeline provided. Lastly, examine the format of the question – multiple choice (is it good to always have the correct answer available?) with four possible answers. In the case of the game show, four well thought-out options. All four of the choices presented could reasonably be correct.

Use the design of this game show as a model to learn to write exams that will promote individual work. Key elements include:

- Write questions that cannot be easily or quickly looked up in common reference materials
- Use time limits wisely
- Assume that the person will look up the answer if they can
- Carefully select incorrect answer choices

Aside from television, there are experts who share their guidelines for writing exam questions. The University of California at Davis has prepared a list of suggestions³:

- Present a single, definite statement in a concise easy to read stem. Students should know what is being asked from the stem, not from the choices. Eliminate irrelevant material. Address only one piece of information per question.
- Avoid negative statements. Negative words and prefixes are often misread. Never use double negatives. If negatives must be used capitalize, underline, or otherwise highlight the negative term.

- Use only plausible and attractive alternatives as incorrect response choices. Good response choices are those that can help pinpoint student's knowledge. It is therefore best to include choices that reflect common misconceptions or errors in logic. Furthermore, when choices are obviously incorrect they are, for all practical purposes, not real choices.
- Avoid giving clues to the correct option. Clues can take many forms: inconsistencies in grammar, sentence lengths, structure or style; use of words such as 'always' or 'never'; presenting exhaustive opposites; answers to other questions on the exam, to name a few.
- Avoid interdependent items where the answer to one item is necessary to work on the next item.
- Use as choices 'all of the above' and 'none of the above' sparingly, if at all.

Given these tips, the instructor can write good questions. However, the design of good questions needs to include a few other factors in order to accurately assess what the student has learned in the web-based environment.

Search Engine

All students, in time, learn to use a web-page search engine, such as Google. If one assumes that a student will type in key words from the question into the engine, will the resulting pages produce the correct response? It depends on the question. Therefore, assume that the student may use Google (for any type of assessment tool) and plan for that. To discourage the success of this method, write the question in reverse form, that is, leave out the key word(s) and provide the definition or supporting information. For example, an unsuccessful question would be “What is capnography?” A more successful question would be “What is the procedure used in the operating room that monitors the expired gasses from a patient under anesthesia?”

Text Books and Class Notes

Always begin with the assumption that the student has opened their text book and class notes. Therefore, the instructor should open the textbook to the index and/or glossary when test questions are written. See if the questions can be answered with a glance toward these sections of the book. Instead, focus on questions which are answered deep within a paragraph within a chapter. Try not to ask questions for which the answers are clearly identified in a large or well-known table within the text. Certainly there may be necessary information in these tables but there may be increased individual work when information from the tables must be synthesized. For example, compare two entries, etc.

Again, assume the book and class notes (and any other material) are open and available to the test-taker regardless of the instructions provided.

Time and Deadlines

One of the most critical features of good assessment design is to assign a task in an appropriate amount of time without excess of work being required. The focus being that even if a student has enough time to look up some of the answers, it is impossible to look up all of the answers and be successful on the exam in the given time period. Each course has content that varies in depth and length, therefore, work must be assigned which will be suitable in duration. How
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much time is the right amount? Of course, this dilemma is the same in a traditional classroom. Exams and other activities must fit into the constraints of the time period. The author has found that for simple rote fact learning (as opposed to problem solving classes), an hour exam comprised of multiple choice and short answer questions can be made up of about forty questions.

Limiting the availability to access an exam (four days, for example) can also limit the amount of time that students might be able to take their exam and then share information with another student, who in turn would need to take the exam.

Randomization/Versions of the Exam

Critical to successful individual work is the instructor's dependence on the software tool used to provide the exam and its ability to randomize questions, randomize the multiple choice selections and to create multiple versions. Explore the technical capabilities of your testing software. It is essential that all capabilities be employed to maintain a secure environment.

Extraordinarily effective and highly time consuming is the creation of multiple version of exams. The author has found that writing four or five questions per concept and allowing the software to select one of these questions provides exams that are significantly randomized for each student.

Monitoring Web-based Activity ("Big Brother")

The instructor must have the ability to monitor a students' access to exams and if possible, web pages within a course. Is there a way in the software to examine when a student enters the course and how long they are within it? Is there a way to open the content in a second web window to look up the answers while the exam is located in a different web window? (Although carefully designed questions can negate the value of this technique.)

Access to the exam must be guarded. Examine the start time of students and look for students that started and ended the exam at the same time. Then compare their test questions for similarities. If possible, monitor the students question progression and any changes in answers. Be aware of the length of time that a student takes to complete their exam – a poor student who completes their exam in a very brief time may indicate that the student is not following all of the testing requirements.

Honor Statement

As part of providing clear expectations, it is useful to include a question as part of any assignment which outlines the instructors requirements for individual work as well as supplemental materials. Examples of honor statements include:

"I have worked on this exam on my own and have not printed the test."

"Honor Statement: I have completed this exam on my own. I did not ask classmates for assistance or work together with them. I did not consult, compare answers or ask advice from others in this course. This is entirely my own work.

_____ signature"

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One of the benefits of the use of an honor statement is an “in your face” presence of the expectations of the instructor. Placing this statement in the beginning of an exam forces the student to make a conscious decision to ignore the rules. Also, the ground rules for an exam are clearly stated.

Results

Signs of successful individual work are numerous. Examples include

- Grade spread (variation in student performance throughout the class as well as from one class to another)
- Success of students in other classes
- Feedback from employers
- Employer funded enrollment in the class
- Enrollment by students at other institutions
- Student satisfaction surveys
- Performance on national/certification examinations

Remember that traditional classrooms, especially large ones, also have the difficulty of assuring adequate student achievement and measuring such effort. It is important to separate the difficulties in teaching in any format from the difficulties in a web-based environment. There is no perfect way to guarantee that each student is able to leave the virtual classroom with the desired educational outcomes but careful planning of assessment tools is an important technique.

Conclusion

The goal of any education situation is student comprehension of materials and representation of that work in an accurate way. The best plan for delivery of web-based course material is to carefully expect the worst in student behavior. Clearly state expectations and consequences for violations. Explore the dishonest avenues available to the student and put up roadblocks.

In the web-based classroom, the design of an assessment tool requires careful attention to the potential for dishonesty. By identifying sources of cheating, an instructor can limit a student's ability to do so. Of course, this is exactly the same as in a traditional classroom, only the methods vary. If an instructor desires to present a well-constructed class with attention to student outcomes, every effort must be made to design assessment materials as thoroughly as possible.

Bibliography

¹ Ko, Susan and Rossen, Steve. Teaching Online: A Practical Guide. Boston: Houghton Mifflin Company, 2001, p. 95.

² Schweizer, Heidi. Designing and Teaching an On-line Course. Boston, Allyn and Bacon, 1999, p. 30.

³ University of California at Davis Teaching Resources Center: *Basic Rules and Tips for Creating Multiple Choice Items* <http://trc.ucdavis.edu/TRC/testing/item.html>

Biography

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