

An Effective Quiz Strategy for Enhancing Student Engagement while Discouraging Academic Dishonesty

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Introduction

In recent years, students have become less interested in learning and more distracted in class. They have put less effort to be engaged and have become less motivated to comprehend lectures, write notes or ask questions in class. Furthermore, most students don't read textbooks and handouts and don't see the need to memorize or retain knowledge but rather rely on access to Internet resources. Facing these issues, instructors try their best efforts to put more energy to attract students' attention and engagement, but the results are not satisfactory.

The traditional approach of giving lectures followed by homework assignments as a tool for learning, then giving quizzes as a tool for assessment does not always work as expected. Even with a modified grading policy of reducing homework credit and raising credit for quizzes, the same results were observed by the authors. In addition, many students who do not grasp the course material tend to cheat on homework assignments, quizzes and tests. Instructors typically deal with student plagiarism in a passive way by preventing it through detection and penalty strategies. This "policing" process against plagiarism requires a lot of planning and efforts by the instructor and does not necessarily attract students toward learning. Some concerns and issues were researched and reported by other engineering instructors. Allen et al¹, researched a hybrid quiz and homework approach to tackle similar concerns and issues regarding teaching and learning effectiveness in undergraduate basic mechanics courses. Another research paper² (Lura et al, 2015) focuses on shifting from traditional homework to using select problem quizzes, after students' complaints and questioning homework effectiveness with little correlation to exams.

In this paper, we present the development of a new approach for smart utilization of quizzes to improve student engagement while discouraging them from cheating on class work.

New Proposed Homework/Quiz Strategy

The new approach focuses on replacing the traditional homework assignment by a set of individualized take-home quizzes to be submitted by a deadline (Appendix 1). The quiz assignment includes non-text problems in an effort to prevent students from copying from available solution keys to text problem. After submitting the work, each student is required to orally present his/her work to class. This take-home quiz assignment is equivalent to a homework assignment and carries its credit. As a follow up, another in-class quiz covering the same topic was given to assess students' knowledge and skills gained from this exercise. This hybrid approach (working quiz assignment - then presenting it) was designed to allow students

more time without quiz anxiety for studying and explaining their work. Students were also allowed to consult each other on how to solve their own problems without possibility of cheating from each other. Since they were required to present the problem solution, every student became more interested in understanding not only the solution approach but most importantly the concepts and how to apply them step by step in the problem solution. Thus, the quiz which is traditionally considered an assessment instrument, became an effective learning tool for all students.

Features of the New Quiz Strategy

Some of the positive features for the new strategy are:

- The “take-home quiz” creates an exciting learning opportunity without time pressure or test anxiety.
- Individualized assignments are designed to deter cheating or blindly copying from other students. It was observed that cheating becomes too difficult since students are assigned different and non-text problems. In the meantime, students were encouraged to learn and become engaged while seeking help from the instructor or from each other.
- Problems are not from the textbook and are customized to cover a collection of problems with different ideas and concepts.
- Presenting individual work to class assures student understanding and allows students see a variety of problems presented by others.
- Students become engaged and motivated to learn with seriousness and enthusiasm not only for receiving the quiz credit, but for understanding the subject and showing their best performance before peers and instructor.
- Through numerous interactions, the instructor can understand students’ individual needs, strengths and weaknesses. Feedback helps the instructor improve teaching style and strategy for the following course topics.

Student Behavior Change

Through this strategy, the instructor received more visits from students during and outside office hours. Students attended the class with more questions in mind. The instructor also noticed that the students are now competing for the instructor’s class time in order to work one-on-one to clarify issues related to their individual assignments. The preliminary results as shown by student involvement, survey results and post-quiz results are very encouraging. They indicate that this approach is very promising and is recommended by other instructors to try it and further evaluate it in their courses. Ultimately, this approach enabled the instructor to control the issue of cheating and become able to convert many students from cheaters to active learners. The quiz as a traditional assessment tool became now an effective teaching and learning tool.

Students expressed their satisfaction and wished that this new strategy be implemented for other courses across the school. The implementation of this strategy required more time and effort by the instructor but it was effective in motivating students for learning and deterring them from

cheating. In addition, through more interactions with the students, the instructor received better insight in their style of learning as well as their academic and non-academic weaknesses and strengths.

Impact of the Strategy on Academic Dishonesty

A quiz can be seen as punitive or as a scare tactic for students. Therefore, most students don't like pop quizzes, they need to prepare for the quiz in advance. Even if the quiz is announced in advance, students may not show up then provide excuses in an attempt to make up for the quiz. Making up the quiz is unfair to other students and time-wasting for the instructor. Students may then try to cheat during the in-class quiz. Even missing the quiz and bringing fake excuses is considered a kind of academic dishonesty.

In a published article by MYACPA³, cheating is reported to be common among all higher education institutions. The common reasons for cheating are low academic preparedness, pressure to achieve higher grades, inability to manage time efficiently, inability to achieve academically and easy access to Internet resources.

Two types of treatment for cheating exist: punitive and preventive. The punitive treatment is based on punishing students after catching them cheating. The preventive treatment is based on soft approaches to prevent students from cheating or planning on cheating. The preventive approach does not guarantee enforcement of cheating prevention. These preventive approaches for reducing cheating behaviors include: involving students in contributing to the development of the institution's academic honesty policy, declaring academic dishonesty policies in student handbooks and course syllabi, observing students' behavior during tests and exams, etc. Obviously, all of these actions are passively preventive while requiring a lot of energy and resources.

Upon implementing our Take-home quiz strategy, immediate decrease of cheating was observed not only on the given Quiz assignment but on other course assignments and activities. One of the key factors to this change of student attitude is the recognition that the instructor encourages team work among students and welcomes student request for help. The other key factor was allowing students to take the quiz home instead of the in-class quiz.

The main reason that our strategy is effective in deterring cheating is that the strategy focuses on assessing the intellectual understanding of the assignment concepts and solution rather than assessing just the delivered written work. Cheating is not needed at all in such an active and collaborative learning environment. Our approach to fighting cheating is positively preventive with minimum effort.

In the traditional quiz setting, students illegally access the information from available resources and then claim it is theirs, while in our quiz setting students are encouraged to openly access the information, process it in a monitored learning activity and then legally present it as their own working knowledge. In the traditional quiz setting, students are surprised by a pop quiz and it will likely let them feel the pain for not studying and being always prepared. Therefore, they may attempt cheating. In our quiz setting, students are not surprised but are still guided and

pressured to learn and work toward achieving the educational goal of learning, processing and retaining the course knowledge.

Student Feedback on the Quiz Strategy

The instructor conducted a survey to compare the traditional approach “Homework → Quiz” with the new approach “Take-home quiz → Presentation.” The students’ responses are displayed in Table 1.

Recommendations

- One of the issues of this pedagogical approach is that although our class size was less than ten, a lot of effort was required to conduct the process. In case of larger class size, it is recommended that different quiz assignments will be assigned to small student groups instead of individual students. In a small group, students will interact and exchange knowledge and skills to finish the task. Also, the presentation will be manageable and better executed by a small group.
- It would be more beneficial if the students were invited to develop a rubric for assessing the quiz and post-quiz as well as evaluating each other on the presentation.
- It is recommended that instructor adopt the policy of closed book and notes for tests and exams so that students utilize the quiz strategy to learn the concepts and master the course material knowing that in exams they should not rely on information they may construct from books or notes but on their own knowledge.

Concluding Remarks

- This pedagogical approach created a positive attitude among students after they were offered a take-home quiz instead of the traditional in-class quiz.
- This was an opportunity for them to forget about cheating and fabricating the homework to receive its credit.
- Students are required to present their work. Feeling some peer pressure, all students without exception, became motivated and excited to rise to the task and show their best skills to pass this challenging test in front of the instructor and the class.
- The instructor saw a different attitude from students. After the assignment was given with a deadline, students utilized the instructor’s office hours and competed for instructor’s help during class time.
- Suddenly class time was used efficiently. No negative issues were noticed such as student’s cell phone use, side talks or being bored with the class.
- From feedback and interaction with students, the instructor learned more about their individual needs. Feeling more comfortable, some students acknowledged their weaknesses in math or problem solving. The instructor gave them advice and guidance, and they showed their intent to work hard on these deficiencies.
- Overall, it was a wake-up call for the students to work harder and pay attention to the material presented in class.

Table 1. Student Responses to the Quiz Survey

	Traditional approach Homework → Quiz	New approach Take-home Quiz → Presentation
Student 1	“With the homework, I usually struggle and may be unable to complete it because of the time constraints.”	“With the new approach, I like it because it gave us time to work on one problem, while see a wider range of other problems distributed on all students”
Students 2	“To a certain extent, it may help, but the quiz is sometimes not related to the homework or from outside textbook”	“It is good because it helps me how to solve the problem better. This helps me focus and study better to learn the process.” “Also it allows me to ask the instructor questions on what I am struggling with. He encourages us to ask questions related to the quiz problem.”
Student 3	“This is OK, but sometimes I’m not sure if the answer is right. Later on the quiz I may make the mistake twice”	“I like this method because when we present the quiz, we can see where we are individually struggling with problems”
Student 4	“I feel that homework does not relate to the quiz that much.” “If we don’t understand homework, there is a good chance we will not perform on the quiz either.”	“I like this because it gives time to work on the problem that will be similar to a test.” “It allows us to understand the material compared to just guessing on a quiz.”
Student 5	“Not aggressive enough on making the students learn as the quiz assignment will.”	“This helps the individual student put an effort to help for himself.” “Makes the student understand reasoning for problem steps: like why and how is it done this way?”
Student 6	“Just rush to get work done and don’t learn as much.” “Quizzes are not like the work given.”	“I got one-on-one time (with the instructor) while doing the work.” “I learned faster in shorter time.” “It is simpler: less class distraction and more self-study time.” “I recommend this way for my learning style.” “It is recommended across the school to implement this method.”
Student 7	“This is okay but is not very helpful for students.”	“This works better because we are able to teach ourselves and classmates by giving presentations.” “Also, it motivates me to study more because we want to do well on the quiz, so we are able

		to go home, take our time, review and finish the assignment” “I would like to review the topic in class though.”**
** Instructor’s Comment (student 7 response): “I would like to review the topic in class though.” This response means, after all these learning activities, there might be still some hanging issues that need to be explained in class. This also means that the students became more interested and therefore ask for more in-class learning.		
Instructor’s Response	In the traditional approach, most students blindly copy homework to meet the deadline. They usually don’t put enough effort to understand the material nor the problems they submit. They are usually not well prepared for pop or announced quizzes.	Students value this approach, because some of the credit that was lost in the traditional quiz approach is now diverted to the presentation which is in their control. They can always improve and do better on the presentation. Students are now enjoying a friendly environment with the instructor who gave them a take-home quiz! For the students this was incredible while knowing the professor is still serious about keeping the academic standards.

Concluding Remarks – Continued

- The assignment was initially given as a take-home quiz for assessment, but it became an effective tool for the instructor to teach the students and motivate them to learn. This instructional strategy merged the three functions of the instructor: **1) teaching**, **2) motivating** and **3) assessing** into one integrated activity.
- With this strategy, the instructor saves a lot of energy that was previously wasted in preaching and advising the students to learn as well as policing them to prevent and catch acts of cheating and plagiarism.
- Teaching and learning worked perfectly in sync without sacrificing assessment.
- The strategy is straight forward and easy to implement in any engineering course. One drawback is that it takes an initial effort by the instructor, especially to create individualized assignments.
- The approach was implemented in an HBCU, but it will suit all other schools. Students lost interest in learning and are tempted to cheat as documented in many research papers and reports.

Acknowledgement

The authors would like to thank the Center for Teaching and Learning (CTL) at Central State University, Wilberforce, Ohio, for sponsoring the first author to attend the 2017 ASEE Annual Conference and Exhibition, Columbus, Ohio, June 25-28, 2017. Attending the conference was instrumental in developing the proposed pedagogy and generating this research.

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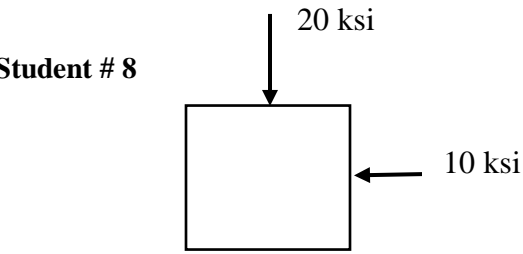
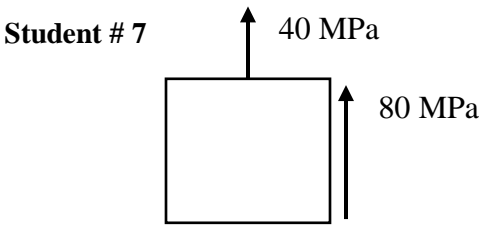
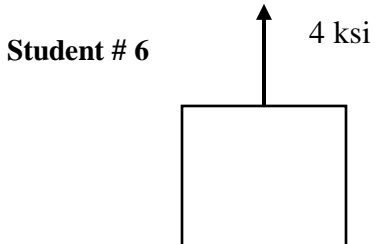
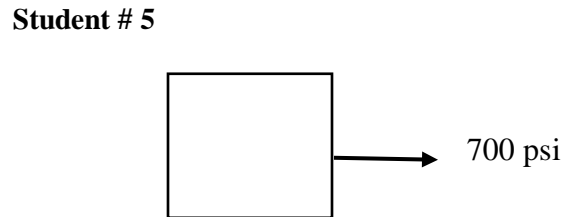
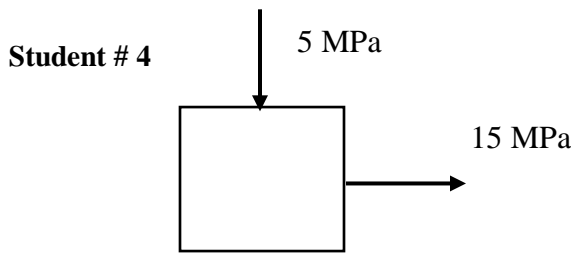
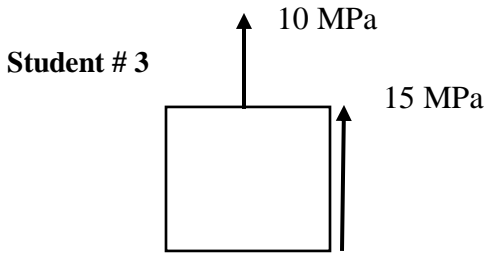
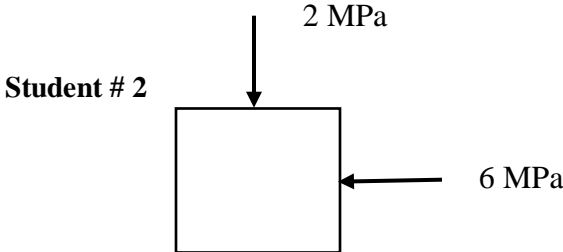
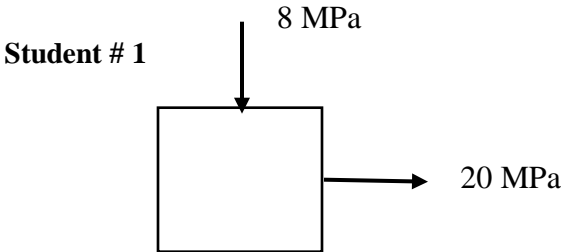
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Appendix 1

Take-home Quiz Assignment

Students are required to work on their assigned problem as indicated. Each student will work on solving the problem and prepare a presentation to the class explaining the problem and entreating questions. In addition to the quiz credit, the presentation is given the weight of a quiz.

For the stress element shown, determine the principal stresses using 2D Mohr's circle. Develop 3D Mohr's circle and explain any changes to the principle stresses and maximum shear stress that will impact the design process.



Deadlines: a) Quiz solution is due by -----

b) Presentation is scheduled on -----