

THE TEST ASSESSMENT QUESTIONNAIRE: A TOOL FOR STUDENT SELF-ASSESSMENT AFTER THE MIDTERM EXAM

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ABSTRACT

This paper introduces instructors to a practical tool, the Test Assessment Questionnaire, which helps students critically evaluate their course progress after the midterm exam. This tool has two benefits: it guides students toward more self-awareness in their studies and it can be used as a part of assessment and assurance of learning efforts. Additionally, it requires minimal class time to implement and virtually no work burden on the part of the instructor. This tool has been piloted and refined in the principles of economics courses. It is recommended for exams with multiple choice questions, true/false questions, and mathematical problems.

INTRODUCTION

When exams are used to assess student learning, the implicit assumption is that the students have submitted work that reflects their understanding of the material after their genuine attempt to learn it. Some students do diligently prepare for exams; some do not. Additionally, some students *believe* that they have earnestly prepared for an exam, when in reality their efforts are not adequate for the grade they are targeting (e.g. students who might say “I thought I got an A” because “I studied really hard” and yet earn a lower grade).

Several studies have investigated student overconfidence. Walstad (2001) calls for further investigation of the psychology of students, suggesting concepts from behavioral economics (e.g. overconfidence) could be used to explain student behavior. Falchikov and Boud (1989) find that students have grade expectations that are higher than the typical distribution for the course. Additionally, students in the principles courses are found to be overconfident in their understanding of material, as measured by their predictions of exam scores (Grimes 2002). Nowell and Alston (2007) find that instructor grading practices can influence the degree of overconfidence.

When faced with a student who is upset at receiving a lower than expected exam grade, instructors may respond by telling students to study more. For the students who only study for two hours the night before the exam and earn a D grade, this strategy surely has merit. However, for other students, simply studying more may or may not result in a higher grade. The lack of

effect of study time on achievement is documented by Becker (1982). This can be frustrating to the students who feel they already are “studying hard”.

Such students may start to blame the instructor for the disconnect between effort and desired grade. Students may label the instructor as “unfair” or the course simply “too hard”. Grimes, Millea, and Woodruff (2004) find that the degree to which students accept personal responsibility for performance affects their evaluation of teaching effectiveness and course satisfaction. In course evaluations, students reward professors who increase achievement in the contemporaneous course, not those who facilitated deep learning for subsequent courses (Carrell and West 2010). Millea and Grimes (2002) conclude that instructors need not “water-down” courses in order to receive favorable course evaluations. Instead, they can positively influence evaluations by addressing negative student attitudes about forthcoming coursework.

Informed by these studies, we introduce a practical tool, the Test Assessment Questionnaire (TAQ), which helps students critically evaluate their course progress after the midterm exam. This tool has two main benefits: 1) it guides students toward more self-awareness in their studies 2) it can be used as a part of assessment and assurance of learning efforts. Additionally, it requires minimal class time to implement and virtually no work burden on the part of the instructor. This tool has been piloted and refined in the principles of economics courses. It is recommended for exams with multiple choice questions, true/false questions, and mathematical problems. We have not experimented with using it for essay exams. It may be possible for an instructor to develop their own version compatible with essay questions.

TAQ DESCRIPTION AND RATIONALE

The Test Assessment Questionnaire guides students through an analysis of their midterm exam mistakes (see Appendix A for a copy). Students are asked about their exam preparation activities as well as studying activities for the course in general. Additionally, students are guided to formulate a study strategy for the remainder of the course.

Logistics

In the class period when the midterm exam is returned, students are also given the correct answers and a copy of the TAQ. The instructor does not devote time to going over the exam. Instead, students are tasked with completing the TAQ as homework; it should take about 5 minutes to explain the assignment and answer student questions regarding the questionnaire. The TAQ is due either in the next class period or one week later (Note: It is important to incentivize the completion of this assignment. For example, it could be worth a bonus point applied to the exam grade or points toward a homework grade). In that class period, the instructor devotes 10 to 15 minutes to debrief the class on the exercise, to answer any remaining questions on the content, and to discuss study strategies (see Appendix B for a study strategies handout). The instructor

collects the TAQs for review outside of class. Depending on the size of the class, it takes about 10 to 15 minutes to briefly skim through the students' answers and record that the student completed the assignment. TAQs are returned to students in a later class period. Some students will subsequently decide to attend office hours to discuss their course progress and get some additional feedback on their study strategies.

TAQ Content and Rationale

The TAQ starts with a series of multiple choice questions regarding course preparation activities. For example, "*How often did you miss our class? a. never b. 1 - 2 times c. more than 2 times*" and "*For how many chapters did you complete the Reading Outline? a. all b. most of them c. a few of them d. none*". Such questions guide the student toward a comprehensive look at whether or not their personal study habits during the course are facilitating their learning. These questions can be tailored to suit the individual instructor's course activities.

The TAQ progresses to ask open-ended questions about exam preparation activities and a comparison of homework scores to the exam score. The answers provide insight into whether or not students are adequately preparing for the exam. In our experience, students do not seem shy in reporting the reasons for their lack of performance on exams; it is not uncommon for several of the students with failing midterm grades to candidly explain the various reasons they did not study much (e.g. studying for a different exam or had to work). Other students will report that they "studied really hard the night before the exam". More successful students will report ramping up their study time for the 2 weeks before the exam. The purpose of the homework-score-versus-exam-score query is to lead students to find a link (or lack thereof) between the two types of assessment. For example, some students see that their scores are clearly linked. If they want to improve their exam scores then it is a wise first step to try to improve on their homework scores. Where there is a wide difference between homework and exam scores (often homework being the higher score), students routinely offer that they rely heavily on their notes when doing homework or work with a study group.

The next portion of the TAQ charges students with reviewing each missed exam question and determining why they think they answered it incorrectly. Whether their perceptions of why they missed a particular question are accurate is a question left for future research. To facilitate this analysis, eight categories of common types of mistakes are listed, along with an "other" option. Students can choose from the following reasons: 1) didn't know a definition 2) couldn't apply a definition I knew 3) didn't read the question/answers carefully 4) knew the answer but couldn't come up with it during the exam 5) didn't know how to set the problem up 6) used the wrong formula 7) debated between two answers and choose the wrong one 8) just didn't know the material 9) other. Once mistakes have been categorized, students are asked to comment on any trend they observe. In our experience, a clear pattern often emerges.

The purpose of analyzing midterm exam mistakes is to lead the student to look at their performance in a critical way. Routinely students approach instructors after a poorer-than-expected performance on an exam, expressing that they do not know what they did wrong. In our personal experience, such students had rarely (if ever) critically reviewed their mistakes. Instead of being fixated on the *number* of mistakes, the TAQ directs students to focus on the *type* of mistake they are making.

This change in focus can be a powerful tool for motivating students to improve their learning. It charts a much clearer path for the student's future study activities. Some students observe that they mostly miss the graphing problems; they immediately see that they need to spend more time with that part of the material. Other students realize they miss questions from lectures on the days when they did not attend class (and while this may seem straightforward to instructors, it is often a profound realization for students).

In addition to student self-awareness, when an instructor knows what type of questions a particular student is missing, advice can be tailored to the student's needs. For students who consistently miss definitional questions, making flash cards may be a suggestion. Students who find that they are debating between two answers and choose the incorrect one understand most of the material but there is a nuance or detail they have not picked up on. When this is explained, they seem to feel much better about the situation, knowing that they "almost have it" now and with a little more attention to detail they will be able to choose the correct answer.

There are at least two types of students for which the economic content may not be the culprit behind their lack of performance: students with inadequate math skills and students with test anxiety. Some students report that they always do poorly when math is involved. No doubt many readers have encountered similar students. This problem often persists despite a math prerequisite for the course. In addition, several students self-identify on the test assessment that they have test anxiety in general. The TAQ does not ask specifically if the students suffer from text anxiety, to do so would be a violation of institutional policy regarding students with disabilities. However, many students volunteer in the "other" category that the reason they did poorly was because of test anxiety or that they are "bad test takers". Both issues warrant further investigation but are larger and deeper than the scope of this paper.

The final question asks students what grade they hope to earn in the course and to identify a new study strategy for reaching that goal. Many students report that they will no longer wait until the last minute to do their homework so that they can attend office hours and ask questions. Other common strategies include doing the reading in advance, reviewing class notes more often for short periods of time, and studying more than solely right before an exam.

DISCUSSION AND CONCLUSION

Our goal is to provide a tool that instructors can immediately use in their classrooms. The only preparation needed is to edit the TAQ to suit the instructor's course activities and to make

photocopies. About 5 minutes of class time are needed to explain the TAQ assignment and 10 to 15 minutes of class time are needed for debriefing. Another 10 to 15 minutes outside of class are needed to review the completed TAQs. This brings the total time cost to less than an hour of the instructor's time.

In its current form, the TAQ is best suited for use by instructors who have taught the same course a few times and who solicit formative feedback from students a few times before the midterm. If an instructor is new to a course or has not asked students for informal course feedback prior to the midterm, then it is recommended that some questions be added to the TAQ to address instructor *mea culpa*.

Additionally, the TAQ can be used in departmental assessment activities. Many instructors are finding that because of the current emphasis on assessment and assurance of learning in higher education, new demands are being placed on their time. Data on why students are missing particular questions can inform curriculum and teaching discussions. Having study habit and exam preparation information on students who score Ds or Fs can shed light on whether students are "not meeting expectations" because they aren't studying or for other reasons.

Perhaps most importantly, students are given a tool that concretely guides them into self-awareness with respect to their studies and students seem to feel positively about the experience. In anonymous end-of-course evaluations, students are asked to respond to the following open-ended statement: "*Please comment on the experience of completing the Test Assessment and/or meeting with me to discuss it.*" While some students leave the statement blank, all students who chose to respond indicated that it was a beneficial or positive experience. Several indicated that the technique was helpful for their study habits in general, not solely the economics course.

The Test Assessment Questionnaire has the potential to be a powerful student aid which requires minimal additional instructor time expenditure and at the same time provides a complement to departmental assessment activities. It is also possible that it can help students improve their final exam scores over their midterm scores. The TAQ's impact on course learning outcomes warrants future inquiry.

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APPENDIX A

You may download an electronic copy of the TAQ at <http://www.scribd.com/doc/34225467/>. Instructors may freely customize the TAQ for use in their classrooms.

Test Assessment Questionnaire

Name: _____ Exam Score Percentage: _____

1. How often did you miss our class?
a. never b. 1 – 2 times c. more than 2 times
2. For how many chapters did you complete the Reading Outline?
a. all b. most of them c. a few of them d. none
3. When did you complete the Reading Outlines?
a. before we covered the topic in class b. after we covered the topic in class
4. For how many chapters did you complete the online Homework?
a. all b. I missed 1 or 2 c. I missed 3 or more
5. How often did you come to office hours or email the professor for clarification on the material?
a. never b. 1 or 2 times c. 3 or more times
6. When did you start working through the exam information / review sheet?
a. as soon as it was available b. 2 weeks before the exam c. 1 week before the exam
d. the night before the exam e. I didn't work through it.
7. For how many chapters did you work some of the Optional Problem Set questions?
a. all chapters and all problems b. most chapters and problems
c. a few chapters and problems d. none

8. How did you prepare for this exam? How many hours did you spend preparing for the exam?
9. How does your exam score compare with your homework average? Why do you think that is the case?
10. Go through the questions you answered incorrectly on your exam. For each question, choose the reason you feel you got the answer wrong. Write the number of each question in the table next to the reason.

Reason	Question Numbers
Didn't know a definition	
Couldn't apply a definition I knew	e.g. #3, #6
Didn't read the question/answers carefully	
Knew the answer but couldn't come up with it during the exam	
Didn't know how to set the problem up	
Used the wrong formula	
Just didn't know the material	
Debated between two answers and chose the wrong one	
Other (please specify)	

11. Do you notice any patterns with the type of question you missed? Explain.
12. What letter grade do you hope to earn in this course? To achieve your goal, what is your strategy for studying between now and the next exam?

APPENDIX B

Study Strategies for Common Exam Mistakes

Didn't know a definition:

Try making flash cards after each class or after you finish reading the chapter. Keep your flash cards with you and review them whenever you have a couple of minutes to spare.

Couldn't Apply a Definition I knew:

After you have the definitions memorized, check to see that you actually *understand* what it means. Try to think of examples that illustrate each definition and add them to your flash cards. If you can't come up with an example, then ask me.

Didn't read the question/answers carefully:

This is a common issue. With the pressure of an exam, nerves kick in and many students rush too quickly. One way to make sure you are not missing details in the question is to "mark up" the question as you read. Underline or circle key words, cross out words in answers that make them incorrect, etc.. Another way to stop yourself from rushing is to physically put down your pencil and take a breath. Try doing this every 3 or every 5 questions. Don't worry – no one will even notice that you are doing it. *Even a very brief pause can be beneficial.*

Knew the answer but couldn't come up with it during the exam:

Does this happen to you often? Test anxiety might be the culprit. You might want to check out some of the workshops on test taking strategies offered for free on campus.

Didn't know how to set the problem up:

Going forward, whenever we do a problem, try writing out the steps in words alongside the calculations. For example, on an algebra problem, you might write 1) set the two equations equal 2) solve for Q^* 3) plug that value back into either equation to find P^* . If you are having trouble figuring out the general steps, ask me for help.

Used the wrong formula:

As you learn new formulas, copy them all into one sheet of paper. Next to each one, describe when you would use it and perhaps copy an example problem there for reference. Frequently review this formula notes sheet and have it handy when studying and working homework problems.

Debated between two answers and choose the wrong one:

This one is so frustrating! Many times, you are able to eliminate 2 answers and then are left deciding between the remaining 2. When you find yourself unable to choose, chances are that you know the material fairly well, perhaps at 80-85%, but there is some detail in that last 15-20% of knowledge that would tell you *definitively* what the correct answer is. If this is the case for you, then your current study strategies are serving you well, but you need to spend a little more time and effort on studying the details. Small, frequent study sessions will often help.

Just didn't know the material:

Maybe you missed class that day or maybe you didn't study. You usually know why you didn't know the material.

Other:

If you feel you are consistently missing questions for other reasons, you should stop by office hours so we can come up with a study strategy specifically for you. (Note: If you selected "other" because you feel the questions are "too wordy" or "tricky" then you are not alone. Across the nation, students tend to feel this way about economics multiple choice questions. Taking your time to read each question/answer carefully can often help.)