

Effective Study Habits and Test-Taking Strategies

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The method described here allows students themselves to identify specific reasons as to why an incorrect answer on a multiple choice examination was selected. Based on these insights, the student, with faculty assistance, can develop or modify current study habits and/or test-taking strategies such that similar problems are avoided in the future.

When students select an incorrect answer on an exam and do not identify and correct their thinking on the topic, they are more likely to make the same mistake again on a subsequent exam. Upon completion of an examination comprised of multiple choice questions, a student is provided the opportunity to review each question on the test and identify each question answered incorrectly.



Types of errors:

Type “A” and type “B” errors occur during the testing session. When called attention to, these errors are easily corrected.

A. “I just misread the question” “I’ll read more carefully next time”

Everyone makes this type of mistake from time to time. It most frequently occurs when students “skim” a question, looking for a keyword or concept that will either point to the single correct answer or allow them to rule out one or more of the incorrect choices. In doing so, the student may fail to pick up on important components of the question. Misreading or misinterpretation occurs equally when reading the stem of the question or the choices. This type of error is more common with questions written in the clinical vignette format where information is included, some of which will be clearly essential (pertinent positives and negatives) and some of which will be included mainly to ensure that the case appears realistic. Working through these sometimes complicated questions requires focus and concentration, and the ability to ignore distractions and distracting information that may interfere with concentration.

Errors of this type are also more likely to occur when students lose track of time and find themselves with more questions to answer than they think they have time for. Upon suddenly noticing that many questions remain unanswered with only little time remaining, students will typically rush through the unanswered questions, thereby missing important information and cues. The result being increased likelihood of

selecting an incorrect answer. The likelihood of misreading a question or set of choices is also increased when students are fatigued or insufficiently rested upon entering the test session. Students who pull “all-nighters” are particularly prone to misreading errors which more commonly occur near the end of the exam when energy and concentration may be waning.

To remedy this type of error, it is recommended first that the student be well rested for the test. The benefits of “cramming” the night before the test are often offset by the “careless” misreading errors that are likely to occur when the student is sleep deprived and possibly tired.

From a procedural perspective, it is recommended, if possible, that the student initially look over the entire test to develop an idea of how much time might be required for the types of questions included on the test and how much total time might be needed to complete the entire test. It is recommended that students progress through the test at a pace that will ensure that all questions are addressed one time with a thoughtful answer provided for each.

B. “I know the correct answer was “X,” but I bubbled in “Y”. It was a careless mistake and I need to be more careful in the future.

This error occurs more commonly when paper and pencil type tests are used but can also be seen with computer-administrated exams. The error is essentially a transcription error. This error occurs in several forms. One occurs when answers are initially marked on the exam document (test booklet) and then transferred to the answer sheet after answering all the questions. Errors may also occur when an answer “bubble” is inadvertently left blank and the chosen answer to the following questions is entered into the blank bubble space on the answer sheet (e.g. the student fails to bubble in an answer to question #44 and the answer to question #45 is entered onto the answer sheet in the blank bubble for question #44). When this happens, a series of following questions may also be answered incorrectly. This error may be discovered by the student at some later point during the test when it is suddenly realized that the number of the question and the number of the bubble to be used for a particular question do not correspond.

This type of error may also occur with computer-administrated tests. With computer testing, students are more likely to answer each question as it is encountered. Some tests are administered in defined sections that the student must answer before advancing to the next section. In these situations, students will not have the opportunity to wait until all questions have been answered before entering their answers.

In order to minimize these types of errors, it is recommended that answers be entered on the answer form or on the computer as they are chosen. Errors are less likely to occur when students select an answer and immediately shift attention to the answer sheet to “bubble in” the answer. The same suggestion applies when taking

computer-administrated exams. The most useful suggestion, however, is to look one final time to be sure that the intended choice is indeed the choice marked.

Types “C,” “D,” and “E” errors reflect inadequate understanding or gaps in knowledge that are typically the result of efforts expended prior to taking the test. These later areas generally indicate inefficient or ineffective habits of learning and weaknesses in methods related to exam preparation.

C. “I had no clue what the right answer was.” “All the answers looked plausible.” “I never saw this material before and I just guessed.”

Errors of this type have several origins. Some indicate peculiarities in how students study, learn, and prepare for exams and others which highlight problems over which faculty have some control. Not infrequently, students comment that, “I got way behind and I just didn’t get around to reviewing my notes or listening to the audio-archived lectures for the last week before the exam and I also didn’t get to do the reading.” Time management is a common problem for medical students. Students who perform poorly as a result of poor time management frequently believe that the best solution is to spend more time studying. While this may be true in some cases, it is more likely that misallocation of time and inefficient study habits are the main concerns that need to be addressed.

Students have also been heard to comment, “I didn’t have anything about this topic in my notes, and so it didn’t occur to me that it would be important or on the test.” These students commonly tend to be detailed “note takers” who try to get “everything down that the professor says in class.” Generally, in preclinical courses, faculty make their lecture content available in some form. In addition, students typically have ready access to multiple sources of appropriate level content on almost any given topic. For these reasons, it is generally not necessary for the student to “get everything down.”

A variant on the type C error is characterized by the student who reports that “I really had no clue how to answer this question because there were words in the stem (or distractors) that I had never seen before and had no idea of what they meant. This problem has been encountered in students who do limited reading and more recently, in students who do not attend class. The language of medicine is robust and new to many students. As curricula have become more vertically integrated, more terms and concepts previously addressed in the third and fourth years are being incorporated into the first and second academic years. This reality merely adds to the vocabulary needed by students and increases that likelihood that some exam questions include these terms.

Another explanation for this type of error is heard from students as “Well, I just didn’t think that this topic was important, so I skipped it.” Students may elect to ignore a particular topic for several reasons. Some students will point out that they took a

course on this subject while in college and felt that they did not need to “learn it over again in medical school,” perhaps not realizing that the scope, depth, and focus of the material might be different in medical school. Others have indicated that “Since this topic wasn’t covered in the Board Review books I use, I figured it must not be important.”

Most frequently, we find this error being made by students who prefer to study alone, relying entirely on themselves and whatever other resources are available to study from. To minimize the problem of inadvertently skipping over a particular topic, it is recommended that students spend some time working together in small groups, reviewing and studying material that is likely to appear on an examination. There is value of group activities in avoiding this particular problem, independent of the size of the group or the specific activities of group study

Type C errors can also occur as the result of miscommunication between the faculty and students regarding testable material. Students have been known to comment “I didn’t study that stuff at all because Dr. X told us in class that that material wouldn’t be on the test.” It is often, instead, found upon review of the recorded and archived lectures, that Dr. X did indeed make such a statement, or one sufficiently close to have implied that the material would not be on the test. This issue raises a cautionary note for faculty: students do pay attention, particularly when faculty address the issue of examinations.

The major cause of type C errors is failure to devote time to a particular topic or failure to appreciate that a particular topic might be tested on the examination. When the problem occurs as a result of inadequate time management, it is suggested that a formal calendar system be used. The student should list topics that need to be studied and enter them into a calendar with specified dates and times for study. During the meeting with the student, faculty may choose to create a “mock” study calendar outlining some current topics to be studied so that the students who may be unfamiliar with using a study calendar might actually see what one looks like and how to create their own. With students who attend class and attempt to “get everything down the professor says,” it is recommended that the student survey or preview the material before class. Acquiring at least some familiarity with material to be considered in class has several benefits. First, basic familiarity with the topic will permit the student to say to himself/herself during class, “I saw this concept/explanation last night when I looked over the material, so I know I can find it again later when I want to study it in more detail.” When the student knows that the material is available, there will be less pressure to write it down while in class. Another benefit of previewing the material before class is that should there be material presented in class that is NOT covered in the available learning resources, the student will then be prompted to take notes for later study or ask about it during class time. While the act of taking notes can help with learning, the competition for attention that occurs when performing two tasks simultaneously, writing and attentively listening, may result in a substantial decrement in the fidelity of both.

An alternative strategy would be to work in small groups. A major benefit of small group interaction is that of identifying and confirming the importance of what might

have been said in class, printed in the syllabus or handout material (PowerPoint images included) or passed down from students who took the course previously. Students who study alone may either mistakenly place too little emphasis on certain topics or too much emphasis on others. When small groups of students get together from time to time to identify by consensus what may be of greater or lesser importance all individuals benefit. Using this approach, the problem of overlooking or under-emphasizing a particular topic is minimized.

D. “I was positive the answer was X.” “It was in my notes that way and I learned it that way but the answer key says the answer is Y” “I guess I learned it wrong.”

In most settings, type D errors are the least frequent of the errors that students make. Four main causes have been identified, each of which can be remedied. The primary cause is making errors made when taking notes in class. Students who attempt to get everything down as the class proceeds are most at risk for this type of error. This type of error also occurs when an instructor simply makes a verbal error in class that does not get corrected at that time. When students are focused on “getting things down” they may fail to adequately process or consider the information as it is being presented. The result is that incorrect information is taken down and this information is learned and used when selecting an answer on the test. This type of error is typically made by students who study alone, without the benefit of fact and concept checking that typically occurs when students spend at least some time together working in small groups.

A variant of the type D error is the following: “I was positive the answer was “X”. It was in the resource material (textbooks, Power Point slides, online material) that way and I learned it that way, but the answer key says that “Y” is the correct answer. I guess I must have learned it wrong.” This variant on the type D error is suggested when students use resources which, most commonly, as a result of inadequate editing, include errors. In reality, vetting and editing errors in published material do occur occasionally both in professionally published works as well as instructor-produced material. In addition, online access to learning resources has increased, and not all of these resources have been adequately vetted or rigorously edited. As students’ access and use more online resources, these types of errors are likely to continue.

A much more subtle form of the Type D error can occur when subject matter is tested about which authoritative opinion may differ or when authentic differences in interpretation may exist. An example of this situation is the student who argues, “The required textbook says that tremor may or may not be seen in Parkinson disease but the board review book I found in the bookstore said that tremor was a cardinal feature of the disease. Who should I believe?” The root cause of this problem is not the fact that there are unanswered questions in medical science, but rather that the question may have been phrased in such a way as to suggest certainty where there really is not any. Questions that tread in these areas of uncertainty or incompleteness

must be carefully written so that confusion as to the exact meaning of stem and the choices is clear and unambiguous to the student.

When counseling students, faculty should have the student identify the error in his or her notes and then inquire how the notes are used when studying. Students who prefer to study alone are less likely to discover these errors in their notes than students who study or work in small groups. Small group work provides the opportunity for students to share their understanding with others in the group, with the common result that inconsistencies and errors, whether from faculty sources, material produced by the students themselves, or material obtained elsewhere, are identified and corrected.

E. “I thought I really knew this stuff.” “I narrowed it down to two answers, but I just couldn’t decide which one was right.”

This type of error is the most common type of error made by medical students. Most students come to a test well prepared, but since students may not know exactly what will be on the test, it is not surprising that some topic areas will be better understood than others. Generally, students know quite a bit about most topics on the exam, but not everything that those who wrote or developed the test judged as test worthy. This type of error is not necessarily viewed as severely problematic unless the number of errors is significant and results in failure on the exam. Typically, when reviewing exam results with the student, errors of this type tend to be “focal” in that they center around a particular topic on the exam. The errors represent a topic-specific deficit in knowledge or understanding rather than a global weakness involving all topics on the test. Guidance in these situations is relatively easy, and the student generally recognizes his or her specific weakness.

A situation in which this type of error can be more problematic is when a particular exam consists exclusively of (or contains a large proportion of) errors involving “must know” content; information that the faculty believes must be known or understood as a criterion for success or competence. While short “pre-tests” of must know information may constitute part of a formative assessment of student progress in a course, the pedagogical philosophy is that at some point during the course, the student must have acquired a competent understanding of this material in order to successfully benefit from subsequent material. The expectation is that students will answer each of the must know questions correctly and that failure to do so suggests inadequate baseline knowledge and a need for a remedial effort at that point in the course. Failure to correctly answer must know questions on a summative exam might preclude advancement to the next level or component of the curriculum.

When advising students who make type E errors, faculty should inquire about study habits, particularly whether students study and whether they prepare for exams alone or together with other classmates. Most commonly, students who make type E errors are students who prefer to study alone. Such students should be advised that there are distinct benefits to spending some study time in small group efforts. A

particular benefit of working in small groups accrues when students quiz each other as part of their study effort. When students can answer questions correctly and defend their answers, they are more likely to perform better on examinations. If some students profess a dislike for group study, or perhaps are simply unfamiliar or unsure of the benefits of group effort, faculty should provide a rationale for its value, pointing out that by spending some time in group study, or at least in group preparation for exams, topics or concepts which an individual student may believe to be unimportant, but which really are, can be identified and discussed thereby helping to ensure that important topics are not overlooked or left unstudied. Conversely, a student might believe that a particular topic is very important and must be mastered at great cost in terms of time and effort, only to be informed by his classmates during group study that the topic was not presented as of being of great importance and may in fact not be represented on the test at all. By spending at least some time in a group effort, both of these causes of being under-prepared for an examination can be reduced.



Confidence in answering a question correctly is increased when students understand and can explain why the correct choice is correct and why other choices are incorrect. The consequences of not knowing why the right answer is right and why the wrong answers are wrong can be particularly troublesome for medical students when the subsequent exam is a high stakes exam such as the STEP 1 exam. Students who understand why they make certain types of errors when answering test questions are better able to make informed and appropriate changes in their test-taking or study habits than are students who lack such insights. The intended result is improved learning, retention, and retrieval of knowledge as well as improved performance on subsequent exams.

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