Effect of self-assessment on test scores: student perceptions

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Ramirez BU. Effect of self-assessment on test scores: student perceptions. Adv Physiol Educ 34: 134–136, 2010; doi:10.1152/advan.00021.2010.—After a sudden increase in most of the individual grades in a multiple-choice test, students were asked to rank the three most relevant factors responsible for this outcome. Among eight others, the availability of a test for self-assessment before the final test was by far the most frequently mentioned (82.4% of the students). Questions applied during different course activities did not have the same effect on student scores as the “online” self-assessment test.

IT IS GENERALLY ACCEPTED that student learning should be the focus of teaching, and the factors that mainly affect learning have been described elsewhere (1, 2). Some factors that may affect student performance, such as access to the internet or library facilities, depend on the country or the institution, but others are at hand for any teacher. Among them, motivation is the most relevant, and other factors that foster cooperative learning, like feedback and participatory activities, have been identified as important for students to be successful (1, 7, 8).

Feedback allows students to evaluate their actual state of learning (3) and should provide valuable information about their understanding and performance (11, 12). Feedback may be given either during “class time,” allowing time for the discussion of right/wrong answers after the application of multiple-choice questions (MCQs) or other question types (true/false or short answer) during course activities, even in lectures, or during “free time,” through the application of tests for self-assessment. Learning requires understanding, and, to gain insight into both processes, frequent feedback is critical (1).

Self-assessment is an essential component of formative assessment and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. Formative assessment is assessment for learning and must be distinguished from the assessment of learning. 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factor (82.4% of the students). All other factors were by far less relevant. Lecture attendance was considered a relevant factor mainly by the few students that were not attending them before the first test. To be nervous during the first test was considered a secondary factor by a few students, but no one gave this factor a high priority. The difference between a printed and an online test was not mentioned as a factor affecting student outcome.

With these results in mind, from then on, multiple choice-type questions were more frequently applied orally (sometimes the question was written in a slide) in every session (interacting lectures or small-group seminars for problem solving or case analysis) to reinforce student self-assessments of their knowledge and reasoning capacity. A student had to answer the question, and he/she could discuss the answer and the underlying explanations for a few minutes with their classmates (those sitting close) before giving the final answer. Each answer was followed by an open discussion among all students (Was the answer right/wrong? Was the explanation incomplete? Why?).

Then, it was time for the third test. Despite the fact that there was an increase in the number of questions done during class time, student marks were lower than in the second test and not statistically different from the first test (Table 1).

**DISCUSSION**

MCQs are widely used for measuring knowledge, comprehension, and the application of learning outcomes (4). According to historical data, the three MCQ tests applied here were of similar difficulty, but the first test was printed and given in the usual classroom and the second and third tests were applied online, in the more comfortable CITECAMP room. Despite the fact that these differences may affect student perceptions of the quality of teaching, they were not considered by them to be relevant to their outcome.

Student performance was significantly better in the second test than in the other two tests. However, the second and third tests were given online in the same room. In the three tests, questions had a similar degree of difficulty, a large amount of supporting material was available, and questions covering the subject were applied and discussed during class time. Therefore, the main difference between the three tests was that the self-assessment process was applied only in class in the first and third tests and both in class and online in the second test. It appears that students learn better when they have the chance to self-assess their knowledge at their own pace.

Learning improves when the learner is mentally actively engaged in the process of learning (1, 10). Therefore, in lectures and seminars, opportunities were given to predict the expected outcomes and to verbalize and discuss the answers to correct misconceptions (7). Also, students were encouraged to reason causally and qualitatively about physiological situations to improve their critical-thinking skills and foster learning with understanding (8). However, only a few students volunteered to participate in these discussions, and it was not possible to assess if the others were involved in the learning process. Most students were not open to engaging themselves in discussion in front of their classmates. In contrast, all students had access to the self-assessment test posted online.

In addition, since the online MCQ test for self-assessment contained questions used the former year to assess the same topic, there was a better match between the question style and test style in the self-assessment test than in the questions used during class time. Moreover, the online self-assessment test allowed three repeats; therefore, feedback was often provided. Thus, students could direct their study by focusing on the aspects needed to strengthen their weakest knowledge in their own way (talking alone or with others, reading, writing, drawing, or other) and at their own pace. This probably provided them with the conditions needed to understand what they were learning and, thus, to reach more meaningful learning, that is, long-lasting and transferable learning that develops the ability to extend what has been learned in one context to new contexts (1, 2, 8). The amount of time taken to learn is variable among subjects (1), and the in class discussion time may have not been enough for those who needed more time to master the subjects. In addition, tests can directly affect learning by promoting better retention, due to an increase in the amount of study time, to an improvement in study strategy, or both (5).

Among the nine main factors mentioned by the students, the self-assessment test was by far the most relevant, since it was mentioned by >80% of them, with the closest other factor mentioned by <40% of the students. Other factors, like a comfortable place (quiet), more study, or availability of supporting material, were considered relevant by 33–38% of the students, and stress was considered a minor issue. All these factors may affect learning, but the susceptibility to them is highly variable among subjects (1).

The decrease in the outcome of the third test was an unexpected result and strongly suggests that the feedback

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**Table 1. Results of the three multiple-choice question tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Percentage of Correct Answers</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>56.7 ± 10.3</td>
<td>56.7</td>
</tr>
<tr>
<td>Test 2</td>
<td>68.5 ± 9.7</td>
<td>67.4</td>
</tr>
<tr>
<td>Test 3</td>
<td>60.1 ± 9.4</td>
<td>59.2</td>
</tr>
</tbody>
</table>

Values for percentages of correct answers are means ± SD. All students completed the three tests. Statistical analysis of the individual data indicated that test 2 was different from test 1 and that test 3 was similar to test 1 (by Dunnet’s multiple-comparison test after ANOVA: \( P < 0.05, \) test 1 vs. test 2; and \( P \) = not significant, test 1 vs. test 3).

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Fig. 1. Factors that affect grade improvement: student self-assessment. The open survey question was as follows: “Rank the three most relevant factors in the improvement of your grade in the test 2 compared with test 1.” CITECAMP is a comfortable room used in test 2 but not in test 1.
provided by the self-assessment test was not replaced by an increase in the in class feedback.

**DISCLOSURES**

No conflicts of interest, financial or otherwise, are declared by the author(s).

**REFERENCES**