WHAT THE EDUCATORS ARE SAYING

Putting the cart before the horse: testing to improve learning

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One source of tension and debate among educators is the role that tests should play in education. On the one hand, some argue that there is a clear need for reliable and valid assessment. Others, however, worry about negative consequences of tests, such as “cramming.” Although the cost:benefit ratio is highly dependent on the context in which testing is used, recent literature is burgeoning with suggestions that there may be pedagogical benefits to testing that have been underappreciated and understudied.

Testing yields better long term retention than repeated studying

Investigating what has been called the “testing effect,” Roediger and Karpicke report on a pair of experiments in which students were asked to study a series of prose passages. In one study, half of the participants were asked to study the material a second time (the “study” group), whereas the other half were asked to write down as much of the material as they could remember (the “free recall test” group). Those in the latter group showed greater long term retention of the material than those who studied the material a second time.

In the second study it was found that the more tests that were given, the more pronounced this difference was. These patterns arose despite the findings that those in the “study” group read the material four times as often as those in the “test” group, and those in the “study” group felt more confident that they had learnt the material.

Psychological Science 2006;17:249-55

The format of the test matters too

Another study has explored this phenomenon in the classroom setting: for each textbook chapter over a term, students were either provided with quizzes (short answer or multiple choice format) or with a series of statements describing critical facts from the chapter. Some material from the text was omitted in both formats. At the end of the course, it was found that students remembered material on which they had been quizzed better than either material studied a second time or material omitted in each format. The short answer quiz format yielded greater retention than did the multiple choice format.

American Educational Research Association 2006; Session 16.020.

Quiz performance need not be monitored to enhance learning

The term “self assessment” was first used in the 1960s to describe the use of quizzes for self administered assessment, rather than the reflective and introspective processes commonly associated with the term now. Consistent with the historical focus, a randomised controlled crossover trial of 121 internal medicine residents showed that learning was greater for modules with self administered assessment questions than for modules without. The moderate effect ($d=0.4$) was confounded to some extent by the time required to complete the module, but 71% of participants believed that question based modules provided a more efficient mechanism of learning despite longer completion times.

Academic Medicine 2006;81:231-8

Satisfaction with feedback is a poor proxy of its quality

For almost a century, it has been recognised that providing feedback is important for performance enhancement.

However, the many reports of student dissatisfaction with the feedback they receive have led to Herculean efforts to improve the quality of this feedback.

In a recent randomised controlled trial, however, Boehler and colleagues have shown that student satisfaction is a poor indicator of quality of feedback. Thirty three participants received instruction in surgical knot tying. Those given specific constructive feedback on their performance improved to a greater extent than those given general compliments. In contrast, the participants’ levels of satisfaction with the instruction provided showed the opposite pattern: those who had only been complimented reported higher satisfaction.

Medical Education 2006;40:746-9

“It is impossible for a man to learn what he thinks he already knows” (Epictetus, circa AD100)

Underlying many of these findings is the phenomenon of poor self assessment (see *Academic Medicine* 2005;80: S46-54). When studying material or learning to perform a new task it is difficult to determine accurately how well one is progressing, despite a strong sense of having learnt.

To overcome such illusions, carefully constructed external feedback is required. This may take the form of quizzes that may be self or teacher administered, or of specific performance assessments. As a result, “studying to the test” should not necessarily be perceived as a bad thing. It provides motivation for students to review material and practise their skills, and, when implemented properly, provides guidance regarding what an expert in the area deems to be important. It also forces educators themselves to consider which aspects of the learning topic are important enough to warrant testing. Thus, testing should not simply be considered a means of assessing learning but also as a powerful means of improving it.

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