

**Bar-Ilan University**

**The influence of pure elaborated feedback on learning  
from tests**

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## **Abstract**

The present study examined the effect of pure elaborated feedback compared to the knowledge of correct response feedback in a practice test (used as a means of learning) on learners' immediate and long term achievements.

Traditionally, tests are used as a means of assessment. However, many studies suggest that tests can also be used as a means of learning (Adesope, Trevisan, & Sundararajan, 2017). Practice tests on studied material that are given as part of the learning process (or any other activity in which learners retrieve from their memory material they studied before), strengthen learning and improve long-term academic achievements, even more than re-studying the material. This phenomenon is known as the testing effect.

Feedback is particularly important for practice tests because it increases their effectiveness (Pan & Rickard, 2018; Rowland, 2014). The feedback in such tests often includes the knowledge of the correct response and / or information on whether the student's response was correct. However, feedback can also be elaborative and include information in addition or instead of knowledge of the correct response and knowledge of its correctness (Shute, 2008). Elaborate feedback can appear in many forms: clues, additional information related to the question, repetition of excerpts from a study material, or an explicit explanation of why the students' answer was correct or incorrect. Including this additional information in the elaborative feedback is intended to contribute to the learners and improve their future achievements.

In most of the studies examining the effect of feedback on practice tests, learners were given knowledge of the correct response feedback. In the few studies in which elaborated feedback was examined, knowledge of the correct response feedback was almost always included (Van Gog, Sweller, 2015). The purpose of the present study was to examine the effect of pure elaborated feedback, which does not include knowledge of the correct response feedback or knowledge of response correctness, on learning from tests, compared to knowledge of the correct response feedback. On the one hand, pure elaborated feedback may be more effective than knowledge of the correct response feedback and serve as a desirable difficulty in learning (Bjork, 1994). Although it is more difficult to extract the correct answer from the

passage in the pure elaborated feedback than in knowledge of the correct response feedback, this difficulty may ultimately contribute to the learner's ability to recall the information on the long term. This is because pure elaborated feedback enables a spaced repetition of the learning material and enables the learners to process the material actively. On the other hand, pure elaborated feedback may be less effective than knowledge of the correct response feedback because it is a more cognitively complex message and may therefore create a cognitive load among learners that will impair their ability to learn from the practice test.

In order to examine the effect of pure elaborated feedback on a practice tests compared with knowledge of the correct response feedback; an experiment was conducted with 80 10th graders divided into two groups. All subjects were asked to learn a short text about the planet Saturn and then answer a practice test that included multiple choice questions and received feedback on their performance. One group received knowledge of the correct response feedback (i.e., the identity of the correct answer for each question in the practice test) for a limited time. The second group received pure elaborated feedback that included for each question a presentation of the relevant paragraph for a limited time, for the purpose of self-searching for the correct answer. Following the feedback, subjects were asked to answer the question once again. The subjects were then examined in two evaluation tests, one immediate and one delayed (one week later), which included repeated questions (which also appeared in the practice test) and new questions. To compare the total exposure time to the study material in both groups, the initial reading time was longer in the knowledge of the correct response feedback condition than in the pure elaborated feedback condition, so that the total exposure time for the text (during the initial reading and feedback) was the same in both conditions.

The results of the study suggested that the percentage of correct answers in the second response to the training test (after receiving the feedback) was higher in the knowledge of the correct response feedback than in the pure elaborated feedback condition. That is, subjects in the pure elaborated feedback condition were sometimes unable to extract the correct answer from this feedback. However, no effect of feedback condition was found in the immediate and delayed assessment tests, both for repeated questions and for new questions. The information retention index, which referred to the probability of successfully answering, on the immediate

or delayed assessment test, a question that was successfully answered on the practice test after the feedback, yielded a weak but interesting finding. The pattern of results suggested that this measure was slightly higher in the pure elaborated feedback condition than in the knowledge of the correct response feedback condition- although this difference was not significant. This finding alludes to a potential benefit of pure elaborated feedback in maintaining long-term learning outcomes, compared to knowledge of the correct response feedback.

These findings can be explained in terms of cognitive overload. The pure elaborated feedback included a relatively large amount of information that the learner had to learn and process in a relatively short time in order to benefit from it. Because the study material was complex anyway, it is possible that the pure elaborated feedback led to an over-complexity that might have resulted in a high cognitive overload on learners, which impaired their performance. Future studies will be able to examine this explanation, as well as to examine whether the influence of the pure elaborated feedback depends on learners' characteristics and experience with such feedback, or on the learning conditions.

In conclusion, the study findings did not point to a benefit of pure elaborated feedback over the benefit of knowledge of the correct response feedback. Therefore, the use of pure elaborated feedback in tests that are used as a means of learning cannot be recommended. Nevertheless, the findings of the information retention index suggest that it might be possible to recommend the use of pure elaborated feedback, provided that the student is able to extract the correct answer from it, and further research is needed to examine this possibility.