Instructional Design Memo

Effective Feedback

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The research is clear: effective feedback is key to effective learning. But what is effective feedback? How can we use innovative approaches to feedback to improve student learning?

The characteristics of effective feedback

According to Hattie and Timperley (2007), the function of feedback in the classroom is to address the discrepancy between 1) a learner's understanding and 2) the learning goal. To accomplish this aim, feedback must provide the answers to three questions that nudge (i.e. regulate) the direction of learning:

Where is the student going? (goals)

How are they going? (current progression)

Where to next? (actions needed to progress toward desired outcomes)

The answers to these questions relate *not* to the learner's innate qualities or abilities, but to the behaviors and processes that comprise their learning. In thinking about feedback, then, it is important to note the difference between feedback and praise. A meta-analysis by Kluger and DeNisi (1996), which looked at the findings of 131 studies related to the effects of feedback across a variety of settings and populations, found that feedback is most effective when directed to a learner's motivation or toward the specific task, and *not* toward the self. They found, in fact, that no praise at all was more effective in promoting learning than praise directed toward the person, or "self" of the learner.

Similarly, Dweck (2008) states that effective feedback is process feedback (e.g. "I see how hard you worked on this problem") versus person feedback (e.g. "You are really smart"). Hattie and Timperley (2007) reported similar conclusions, noting that feedback directed to the learner's person was ineffective, while information directed specifically toward a task and how best to

perform it produced favorable outcomes. For example, suggesting that a learner seek out more information in order to fully answer a question would be preferable to telling him that he is smart enough to find the correct answer.

Also less effective is feedback that focuses on the final product, rather than the process of student work. Process praise/feedback includes feedback about strategies, effort, perseverance, challenge-seeking, improvement, etc., as opposed to person praise/feedback, which refers to the intelligence or talents of the student, or outcome praise/feedback, which puts the focus on the final product (Cimpian, et al., 2007; Kamins & Dweck, 1999; Mueller & Dweck, 1998). Below are examples of process praise/feedback:

 "I like the way you tried all kinds of strategies on the math problem until you finally got it. You thought of a lot of different ways to do it and found the one that worked!"

"I like that you took on that challenging project for your science class. It will take a lot of work – doing the research, designing the apparatus, buying the parts, and building it. Boy, you're going to learn a lot of great things!" (p. 13)

Work by William Brown and his colleagues at Carnegie Mellon University (2006) highlights the importance of *targeted feedback* in student learning. The authors suggest that targeted feedback: 1) provides information related to the learner's recent responses and prior knowledge and 2) guides the student to amend his or her understanding through revisiting the activity for which feedback is provided. For example, the nature of student responses might provide clues about what misconceptions contributed to incorrect responses. Feedback, then, should directly address and clarify these misconceptions. Traditionally, performance evaluations have employed *immediate feedback*, wherein students are simply told whether they respond correctly or incorrectly. With targeted feedback, however, incorrect responses are followed up with immediate support in the form of guided instruction, hints, and other instructional tools, ensuring that students understand the current content before progressing to new material.

Learner receptivity

The effectiveness of feedback relates not only to its structure and how it is delivered, but also to how it is received by the learner. For example, Kulhavy and Stock (1989) indicated that response certitude, or feeling confident in the state of one's own knowledge, plays a

role in the impact of feedback. Feedback is most meaningful when it is provided in reference to tasks performed unsuccessfully that the learner believed he or she had performed successfully, since the learner in this situation tends to be more motivated to reconcile this discrepancy. A learner who performs poorly, and expected that he or she would do so, tends to be less receptive to feedback. In this situation, low self-efficacy (belief in one's ability to successfully complete a given task) contributes to the learner's conclusion that the benefits of reinvesting into fixing a problem are outweighed by the costs of doing so.

Feedback timing

Similarly, feedback delivered before a learner has had the opportunity to fully attempt the task of interest or before she has established a grasp of the concepts will likely fail to produce favorable outcomes. Feedback should address misinterpretations of knowledge, not a lack of knowledge. In the latter cases, instruction to establish familiarity with the learning content is preferable to feedback.

Evidence is mixed with regards to the optimal timing of feedback, with some suggesting immediate feedback and others indicating delayed feedback as most beneficial to learning. In their analysis of the body of research on feedback and learning, Hattie and Timperley (2007) suggest that, in fact, both may be differentially beneficial as a function of task difficulty. According to the authors, immediate feedback is more useful for simpler tasks, while delayed feedback may be preferable on more difficult tasks that require more processing.

The immediate feedback assessment technique

Despite their convenience, multiple-choice questions come with a number of drawbacks. Unlike more subjective testing procedures, learner responses to multiple-choice items are devoid of nuance; answers do not allow the examinee to express their degree of understanding with regard to the subject matter, but only to select a pre-articulated response. Their answers, then, are either right or wrong. Because the only feedback students receive on such test involves whether they answered correctly or not, little opportunity exists to revise understanding.

The Immediate Feedback Assessment Technique (IF AT) provides an alternative to traditional multiple-choice tests that addresses these shortcomings through a built-in feedback mechanism (Epstein et al, 2002). The IF AT form provides multiple choices that learners scrape off

to reveal either a star, indicating a correct response, or a blank space, indicating an incorrect response. This format allows test-takers to receive immediate feedback about the accuracy of their responses and to continue responding until they select the correct answer, often for partial credit.

Epstein et al (2002) illustrated the effectiveness of IF AT by comparing it to multiple-choice testing without immediate corrective feedback. Students who were tested using IF AT showed improved performance on follow-up exams and tended to respond correctly to items on which they had provided an incorrect response on the initial test. They corrected these misconceptions even when the wording of follow-up items were changed and the underlying concepts of interest retained.

References

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