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Assessments That Support Student Learning

Tomorrow's Teaching and Learning

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Imperfect feedback from a fellow student provided almost immediately can have much more impact than more perfect feedback from an expert many weeks later. Students learn a lot by doing peer assessments – particularly when done as a group activity.

Folks:

The posting below, written by Carl Weiman and Sarah Gilbert, gives a nice summary of the type of assessments that support student learning. The summary is of the longer article by G. Gibbs and C Simpson, on "Conditions Under Which Assessment Supports Student Learning," in *Learning and Teaching in Higher Education* , V. 1, pp. 3-31, (2004). http://www.open.ac.uk/fast/pdfs/Gibbs and Simpson 2004-05.pdf Reprinted with permission.

Regards,

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UP NEXT: Cyberbullying

Tomorrow's Teaching and Learning

---------- 937 words ----------

Assessments That Support Student Learning

www.cwsei.ubc.ca Carl Wieman Science Education Initiative updated April 2015

Key points and factors from the review paper "Conditions Under Which Assessment Supports Student Learning," by G. Gibbs and C. Simpson[1]

(extensive references to data supporting all these points are listed in the original article)

From the students' point of view:

• What is tested in a course dominates what students think is important and what they do.

• Effective feedback is the most powerful single element for achieving learning. Feedback that is not attached to marks can be highly effective.

• Students who focus on picking up cues as to what will be on exams and study accordingly do much better than those who do not. Students often realize this form of studying is not the same as studying to master (i.e. understand and apply) the course material.

• Students prefer courses with a significant marked assignment component, feeling that such courses provide them with more practice and feedback, and the assessment is fairer.

Marked assignments versus exams:

• Much assessment fails to engage students with appropriate types of learning.

• Exam scores correlate very weakly with post graduate performance. Scores on marked assignments are better predictors than exams of long term learning retention.

• When assignments are a significant fraction of the course mark, the failure rates are 1/3 what they are when course mark is based solely on exam scores. Students also study and learn in more naïve ways when the mark is based solely on exams. Although not in Ref. 1, there are techniques to minimize cheating on such marked assignments.[2]

Factors that make assessments contribute to learning (and are frequently neglected)

1. Students should be assigned and assessed tasks that:

• are focused on the most important aspects of the course (tied to learning goals),

• require extended time to complete,

• are given frequently,

• engage students in appropriate forms of study/effort.

2. Students need to have a clear concept of the assigned task and of learning in the discipline. The criteria for grading the assignment needs to be explicit and understood by the student.

3. The single most important element of assessment supporting learning is the frequency and type of the feedback provided with the assessment. Feedback that supports learning:

• is frequent and sufficiently timely to the task so that it still matters to the student,

• focuses on student performance and learning, rather than student characteristics,

• is specific and detailed, addresses small chunks of material, and provides guidance for future efforts,

• matches the purpose of the assignment and encourages the student to improve,

• is supported by mechanisms that require the student to attend to and act upon the feedback.

Implementing good assessment and feedback without spending excessive time marking

It is particularly challenging to have frequent assignments and timely feedback in large-enrollment classes. Below are a few examples of ways to do this.

• Online, computer graded homework. There are numerous systems for this. (Instructor needs to generate or find source of good multiple-choice questions, many systems provide these.)[3]

• Problem-solving sessions associated with quizzes or homework. This could be informal (groups of students voluntarily get together to work on problems with or without TA or instructor present) or formal (tutorial, recitation, workshop with TA and/or instructor using Socratic approach).

• Peer Instruction:[4] during class pose questions, student discussions about which answer is correct, vote on answer, instructor does short lecture on which answer is correct & why. Works in large lecture halls (This moves the feedback part into the classroom and shares it between students and instructor. Some coverage of material is moved from lecture to assigned reading.)

• Regular in-class group exercises done in stages that include partial deliverables (sketches, lists, worksheet answers, etc) which are discussed in class. Simply working in groups provides "instant" peer feedback (as above), and the whole class benefits from feedback that results from the instructor-led discussions at intermediate stages of the exercise.

• Just-In-Time Teaching:[5] Web-based assignments due a short time before class, followed by discussion/lecture focusing on areas of student difficulty (often involves adjustment of teaching based on responses; for large classes, instructors usually go through a subset of the responses). Can also be implemented as quiz at start of class with electronically collected responses.

• Have some long-answer or essay-type questions on assignments, but grade only some of these (important to be clear to students that they will get some credit on a problem for turning somethin in, and a subset of those problems will be graded– students won't know in advance which questions will be graded).

• Have multistage assignments with feedback in the middle that students need to use to complete assignment (way to get students to act on feedback).

• Peer assessment (important for instructor to provide good marking rubric). Imperfect feedback from a fellow student provided almost immediately can have much more impact than more perfect feedback from an expert many weeks later. Students learn a lot by doing peer assessments – particularly when done as a group activity.[6]

• Self assessment or reflection assignments (e.g. have students grade own work using a rubric created by instructor, or have students go over a problem from previous assignment that they got wrong and explain what they did, and why it was not the correct approach.)

• 2-Stage exams:[7] students do the exam individually first, turn their answers in, and then repeat the exam in groups. Students get timely feedback from each other and learn from the exam via reasoning with peers. They usually do significantly better on the group part vs. the individual part.

The bottom line?

Teaching students to monitor their own performance should be the ultimate goal of feedback. Continuous support for improving these skills will help students transfer learning to new situations and become effective lifelong learners.

References

[1] G. Gibbs and C. Simpson, "Conditions Under Which Assessment Supports Student Learning," *Learning and Teaching in Higher Education* , V. 1, pp. 3-31, (2004).

[2]http://www.open.ac.uk/fast/pdfs/Gibbs and Simpson 2004-05.pdf Effective techniques are designing assignments to be of obvious benefit to the learning of the student, have substantial overlap with the exams, and have some portions of the assignment that involve "explaining in your own words".

[3] S. Bonham, "Reliability, Compliance, and Security in Web-Based Course Assessments," Physical Review Special Topics - *Physics Education Research* V. 4, paper 010106 (2008).

[4] C. Crouch and E. Mazur, "Peer Instruction: Ten Years of Experience and Results," *American Journal of Physics* , V. 69, pp. 970-977 (2001).

[5] See: http://jittdl.physics.iupui.edu/jitt/

[6] K. Topping - *Review of Educational Research* , V. 68, No. 3, 249-276 (1998), http://rer.sagepub.com/cgi/content/abstract/68/3/249

[7] B. Gilley & B. Clarkston, "Collaborative Testing: Evidence of Learning in a Controlled In-Class Study of Undergraduate Students," *J. College Sci. Teaching* , V. 43(3), pp. 83-91 (2014); G. Rieger & C. Heiner, "Examinations That Support Collaborative Learning: The Students' Perspective," *J. College Sci. Teaching* ., V. 43(4), pp. 41-47 (2014).