

Making assessment promote effective learning practices: An example of ipsative assessment from the School of Psychology at UEL

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There is a wealth of literature that attests to the benefits of retrieval practice in the long term retention of academic material (see Roediger & Butler, 2011 for a review). Unfortunately, there is also evidence indicating that students rarely report using this method of study (e.g. Karpicke, Butler, Roediger, 2009). The authors have piloted the use of an Ipsative format of assessment that imposes the use of retrieval practice via self-administered testing in the virtual learning environment Moodle. The purpose of this paper is to identify the rationale for the use of Ipsative Assessment in a programme's pedagogical repertoire and to briefly overview the implementation of this format of assessment.

Retention of academic material: The Testing Effect

THE TESTING EFFECT' refers to the well established finding in cognitive psychology that repeated self-testing (i.e. retrieval practice) of material produces superior recall to an equivalent period of time re-studying said material. Literature on the testing effect has existed since the very early part of the 20th century and has undergone something of a resurgence in recent times owing to allied literature demonstrating the relative ineffectiveness of repeated study, i.e. simply re-reading material (Karpicke et al., 2009). A full review of the literature is beyond the scope of this paper; the interested reader is referred to an extensive overview by Dunlosky et al., (2013). For the purposes of this paper it suffices to say that the efficacy of the testing effect has been demonstrated with different test formats e.g. MCQs (Marsh et al., 2007); short answer questions involving cued recall and inferential responses across different knowledge domains (Butler, 2010); and essays (Roediger & Karpicke, 2006). The testing effect has also been shown between different test formats, e.g. the effect of multiple choice tests on cued recall (Fazio et al., 2010) and vice versa (McDaniel Howard

& Einstein, 2009). It has also proven effective for different educational materials e.g. lectures (Butler and Roediger, 2007); texts (Butler, 2010); and multimedia (Johnson & Mayer, 2009). Testing effects have also shown durability over different retention intervals, easily lasting an academic term (McDaniel et al., 2011) and been demonstrated to be effective outside of the laboratory in real classroom environments (McDaniel et al. 2012). Overall the literature on the testing effect is extensive, broad and highly convincing.

Student study practices: Do students use retrieval practice as part of their studying repertoire and are they aware of its benefits?

Contemporary evidence suggests that the majority of students do not use retrieval practice (i.e. repeated self-testing) as a learning strategy. Karpicke et al. (2009) found that 11 per cent of students reported using retrieval practice when asked to free report their range of study practices and only 1 per cent reported retrieval practice as their top ranked study strategy. Even when given a forced choice response with retrieval practice as an option alongside re-reading and 'other study practice', only 18 per cent indicated a willingness to adopt it. An

examination of the explanations students gave for the utilisation of particular study methods revealed only 8 per cent of them identified that they thought that the act of retrieval practice was an effective learning aid. Karpicke & Roediger (2010) demonstrated that students' predictions of their subsequent performance on a delayed test were similar between learning conditions involving retrieval practice and re-studying even though their performance was superior for the former.

Unfortunately, student inclination to adopt retrieval practice appears to be related to attainment: Hartwig and Dunlosky (2011) found use of retrieval practice was associated with attainment and used extensively by the highest attaining students. This is particularly regrettable as Ehrlinger, Johnson, Banner, Dunning and Kruger (2008) demonstrated in undergraduate populations that the lower attaining students exhibit the poorest meta-cognitive capacity i.e. they are the least likely to realise their own shortcomings (The Dunning-Krueger effect) which the strategy of retrieval practice has been shown to successfully address (Boettcher, 2013). In summary, the literature indicates that not only is the uptake of retrieval practice as a study strategy poor overall, it is poorest for those who would benefit most from its capacity to correct meta-cognitive inaccuracies.

Ipsative assessment

The ipsative format of assessment is a natural extension of retrieval practice whereby a test is set up such that the learner has the objective of competing with, and improving on, their previous performance on the same test. This stands in contrast to the arrangement whereby the student obtains a fixed score from a single attempt at a test that is then used to rank their level of attainment in relation to their peers. The evidence of improvement derived from the Ipsative approach promotes student engagement with developmental feedback as they can see its benefits for their attainment (Hughes et

al., 2014). However, a significant barrier to the implementation of ipsative assessment has been the volume of additional feedback and organisation inherent in its design (Hughes, 2011). Happily, contemporary Virtual Learning Environments mean that the implementation of ipsative assessment need not be resource intensive, especially if combined with an MCQ test format where the marking and feedback is automated, such as that used by McDaniel, Wildman and Anderson (2012). VLE's also have the capacity to automate an individual user's access to subsequent assessment according to whether they have acted on previous feedback (e.g. Hepplestone et al., 2011). This progress contingent release feature brings with it the opportunity to incorporate elements of Competency Based Learning (CBL) as part of a module's assessment diet in that students can be required to demonstrate a mastery of key material before they can progress onto further material.

Turning the research into practice: the implementation of ipsative assessment

The ipsative assessment was introduced into a core level 4 introductory module covering biopsychology, social psychology and individual differences on the BSc Psychology Programme at UEL. Students were set weekly MCQ quizzes based on that week's lecture content via the VLE Moodle. Taken together these quizzes formed a compulsory assessment component for the module, which was deemed necessary to negate the Dunning Kruger effect. The quiz administration settings were configured such that the following conditions were met:

- i) Students had immediate access to their feedback and were required to respond to it with subsequent attempts that corrected previous errors. This was achieved by a simple configuration of the feedback options in Moodle's quiz settings such that all types of feedback were deferred until after the attempt was completed, but that the 'show correct answer' option was disabled meaning

that the students had to discover the correct answer for themselves.

- ii) Each quiz promoted timely engagement with that week's lecture materials. This was achieved in two ways. Firstly, by setting the conditional access for each quiz to commence immediately after the conclusion of the relevant lecture. A date near the conclusion of term 1 was specified as the deadline by which all of the quizzes had to be completed; a rolling weekly deadline was not adopted because it would have caused issues in the event of late starting students and periods of student illness.

Secondly, the conditional release feature in Moodle's quiz settings was configured to make the availability of the following week's quiz contingent on students obtaining 100 per cent on the current quiz. The 100 per cent criteria was set to ensure that students had fully engaged with core material derived from the learning outcomes of the lecture and provide a disincentive to students leaving all of the quizzes until near the deadline at the end of term.

- iii) Systematic guessing, collusion, or simply looking up the answers mid-assessment was precluded. To achieve this, the quiz administration settings in Moodle were configured to impose a strict time limit on each attempt, randomise the order of each quiz item and the position of the correct answer for each item on each attempt. Each quiz item was also configured to appear on a new page as a further deterrent against collusion and systematic guessing.

Pedagogical issues and summary

Data analysis on the implementation of the ipsative assessment will be the subject of a subsequent paper. Initial impressions of the introduction of this format of assessment are very positive. Of particular note was just how readily accepted the assessment was among the cohort of students and how easy and reliable the assessment was to set

up and monitor in Moodle. In addition to the potential advantages for the students in terms of their retention of module material, the use of this assessment gives lecturers a meaningful real time index of students responding to feedback and learning.

Whilst the implementation of the ipsative assessment has not presented issues apparent at this early stage; there are a few points to be made with respect to its use. Firstly, ipsative assessment is not simply a replacement for other forms of substantive assessment such as coursework essays and timed exams. Arguably, its greatest utility is in supporting the preparation for such other forms of assessment by promoting optimal study practices and facilitating the retention of core material. Secondly, as with any assessment format, ipsative assessment can only be as effective as the quality of the items of which it is composed. The implementation reported here exclusively involves Moodle based quizzes. Accordingly, good practice in the design of MCQ questions becomes a primary concern. The reader is referred to Haladyna & Rodriguez (2013) as a useful resource in this respect. Thirdly, where a required level of attainment is specified as part of the ipsative assessment approach, care is required in its promotion to avoid issues associated with the competency based learning approach. For example, caution must be exercised in not solely promoting a 'learning only to the test' approach to assessment. Equally, one must be mindful of the academic skills that are less intensively tested, or not tested at all, in the ipsative approach such as critical thinking, integration/formulation of knowledge, written composition and verbal presentation. The development of these skills would be better served by alternative forms of assessment. An insightful paper on this and other relevant issues can be found in Hyland (1994).

To conclude, the literature provides strong support for the efficacy of retrieval-practice in the retention of academic material, but also indicates that few students use it of their own volition and that it is the very

students who are least inclined to use it who would likely benefit most from its adoption. Incorporating the ipsative format of assessment into a module's assessment diet has the potential to remedy this problem and has significant benefits for lecturers who can use it as an ecologically valid index of student engagement.

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