

QUICKBITE: Guidelines for designing and developing examinations

What is involved in planning examinations?

The planning of examinations requires some careful and systematic decision-making:

- Is an examination appropriate for course learning objectives?
- What form of examination should be used?
- How do I go about planning the actual items or questions?
- What sort of preparation do students need to undertake the examination?
- How will feedback be provided?
- Who else needs to be involved? What's the best way to go about this?
- How can examination quality be evaluated? improved?

This "Quickbite is primarily concerned with the preparation of examinations designed to elicit written responses. Many of the suggestions however, are equally applicable to the preparation of examinations conducted in other modes such as oral examinations or those conducted using electronic media (e.g. online quiz tools) though these applications are not specifically addressed directly.

Is an examination appropriate for course learning objectives?

There are two reasons to choose examinations for assessment:

- *effectiveness* – an examination offers students better opportunities to demonstrate particular course learning outcomes than any other form of assessment.
- *efficiency* – an examination offers a solution to problems attributed to increasing class numbers, decreasing tutor numbers, tighter timelines for finalising grades and/or perceived increases in cheating (e.g. plagiarism).

Examinations can be both effective and efficient. However, understandably the need for efficiency can be the dominant factor influencing the choice of examination in problematic educational contexts. Where this is the case, other possibilities should be explored before the decision to use examinations is finalised and it is wise to document the reasons for the choice to inform performance reviews or to elaborate on relevant sections of academic portfolios.

What form of examination should be used?

Examinations can vary according to a number of dimensions - form (short answer, extended answer, essay, multiple-choice, true/false etc): access to resources ('open' book or permissible use of equipment such as calculators): or, in the amount of information provided (unseen' questions', final questions selected from a set provided in advance, exact questions provided in advance to enable preparation).

The choice depends on institutional policy (see references), the type of learning objectives students are to demonstrate, the resources available and the opportunities that can be provided for students to gain experience in making the required types of responses and doing so under the conditions in which the examination is to be conducted.

How do I go about planning the actual items or questions?

The development of an overall course assessment 'design brief' is highly recommended as a preliminary step. This allows course coordinators to identify all tasks that will comprise the course assessment plan and to relate individual tasks to particular course learning objectives (Biggs 2002).

Table 1: An assessment plane 'design brief'

Learning outcomes (LO)	Type of learning/Type of task					Total tasks for each LO
	Remembering	Understanding	Applying	Analysing	Creating	
i.) Read and interpret tables, graphs, and charts		MCQ (2 items)	MCQ (4 items)	MCQ (2 items)	PST	2 tasks
ii.) Represent and organise data by creating lists, charts...					STPT x 3	1 task
iii.) Analyse data using mean, median	MCQ (2 items)			MCQ (4 items)	PST	2 tasks
iv.) Predict and test reasonableness from data using interpolation...		MCQ (6 items)	MCQ (3 items)	MCQ (2 items)	PST	2 tasks
Total	MCQ (2 items)	MCQ (8 items)	MCQ (7 items)	MCQ (8 items)		

Adapted from Mueller, 2006

The example in Table 1 illustrates a course with three assessment tasks – a Multiple Choice Question Examination (MCQ), a Problem Solving Task (PST) and three Short Tutorial Practice Tasks (STPT). From this it can be seen that the examination component is to consist of 25 MCQ items which are to address specific learning objectives at specific levels of Bloom's (revised) Taxonomy (see Krathwohl 2002). While the column headings in this particular example reflect levels of thinking according to Bloom's taxonomy, other headings can be used with different types of learning objectives. Many of the resources based on Bloom's Taxonomy are useful in suggesting appropriate wording for examination questions or items (see for example Hughes, 2007a, 2007b). This approach also supports the development of criteria and standards to be used as a basis for transparent, defensible and consistent assessment judgements.

What sort of preparation do students need to undertake the examination?

It appears common for students to consider rote learning as appropriate preparation for examinations regardless of the intentions of the assessor or the form of the examination. Therefore, the first step in preparing students is to make the design of the examination transparent. Including a version of Table 1 in course informational material is one way of doing this. Labelling individual examination questions or items (e.g. 'remembering', 'analysing', 'creating') and providing students with examples of acceptable and unacceptable responses and opportunities to practise developing responses for themselves are also effective forms of students preparation.

Adequate preparation is particularly important if students are to make best use of their time and resources during 'open book' examinations.

How will feedback be provided?

As the provision of feedback has been found to be one of the most effective strategies teachers can employ (Gibbs & Simpson 2004) it is important to incorporate feedback into examination processes. Marks alone are one of the less useful forms of feedback as two students can achieve exactly the same scores on a multiple-choice examination while demonstrating quite different patterns of achievement. It is more helpful to provide students with feedback that allows them to identify the areas in which they have done well and areas in which they need to improve. For example, feedback on the multiple-choice examination outlined in Table 1 could be provided in relation to individual learning objectives or Bloom's cognitive levels. If automatic scanning is to be used for assessment this can be set up in advance to easily provide the type of feedback required. Where marking is manual, grids or tables can be used for feedback.

Who else needs to be involved? What's the best way to go about this?

The examination 'design brief' (Table 1) can be used effectively with:

- tutors through involving them in the design process as a form of task 'moderation' – this facilitates ownership in the assessment process and develops the shared understanding required to ensure that effective guidance and feedback are provided to students and that assessment judgements are consistent
- other contributors to examinations (e.g. guest lecturers) through providing them with precise directions or specifications (e.g. a request for "four MCQ items that demonstrate an ability to analyse data using mean and median" is likely to be more helpful than a request for "four items from the lecture in Week 5").

How can examination quality be evaluated? improved?

Assessment can be evaluated in a number of ways. A format such as that used in Table 1 is useful for the analysis of existing assessment plans and tasks including examinations and so can form the basis of evaluation and revision activities. Surveys of student satisfaction with courses and teaching generally include specific assessment items though further investigation (e.g. focus groups, online discussion boards) is generally needed to relate ratings to particular tasks such as examinations. Peer review of assessment documentation such as plans, descriptions in course informational materials and instruments such as examination papers is a further source of data to inform ongoing revision and enhancement of assessment/examination quality.

General References

- Biggs, J. (2002). Aligning teaching and assessment to curriculum objectives. Retrieved 18 October, 2004, from http://www.ltsn.ac.uk/embedded_object.asp?id=17536&prompt=yes&filename=IC022
- Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. Learning and Teaching in Higher Education Retrieved 19 April, 2005, from <http://www.glos.ac.uk/shareddata/dms/2B70988BBCD42A03949CB4F3CB78A516.pdf>
- Hughes, C. (2007a). *Elaboration of the six levels of thinking in Bloom's (revised) Taxonomy – a workshop resource.* <http://www.tedi.uq.edu.au/downloads/quickbites/Bloom's%20levels%20of%20thinking.doc>
- Hughes, C. (2007b). *Multiple-choice questions (MCQs) and Examinations – a workshop resource.* http://www.tedi.uq.edu.au/downloads/quickbites/MCQ_Quickbite%20Aug07.doc
- Krathwohl, D. (2002). A revision of Bloom's taxonomy: An overview. *Theory into Practice*, 41(4), 212-218.
- Mueller, J. (2006). Authentic Assessment toolbox. Retrieved 29 October, 2006, from <http://jonathan.mueller.faculty.noctrl.edu/toolbox/tests/whatshoulDIassess1.htm>

Assessment resource developed by Dr Clair Hughes (TEDI/The University of Queensland)

UQ Specific references

General Award Rules <http://www.uq.edu.au/study/index.html?page=12450>

HUPP 3.30.1 Assessment <http://www.uq.edu.au/hupp/index.html?page=25109&pid=25075>

myAdvisor > Assessment <http://www.uq.edu.au/myadvisor/>

SASD Business Process Calendar > Examinations (login and Kerberos password required)
<https://www.uq.edu.au/secure/sasd-bpc/>