Designing assessment for learning: an overview

More than any other aspect of the curriculum, well-designed assessment is the key to engaging students in engaged and productive learning.

In this overview:

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Why assess?

One of the first things to consider when designing assessment is its purpose. Is the assessment to be used diagnostically or formatively to direct teaching or learning priorities and effort? Is it a conclusive, summative assessment in which students will demonstrate what they have achieved? Or is it to accomplish other purposes? This decision should have a considerable impact on the design of the tasks, the scope of the task, the kind of feedback students should expect, what students are required to do with the feedback and whether they will have the opportunity to redo or resubmit their work.

What to assess?

Designing assessment for a Unit of Study is tantamount to designing what and how students will learn. What is being assessed, therefore, should be closely aligned with the stated learning outcomes for the unit. A well designed set of learning outcomes for the unit will make the design of assessment tasks a great deal easier. It is good educational practice to communicate to students what you are trying to achieve and what they should expect to gain from your topics. It is not only helpful for students, but the very task of articulating your aims for teaching the unit can you help you to clarify these matters in your own mind.

How to assess?

More than 80% of assessment in universities comprises essays, reports, and traditional time-constrained exams. While these familiar approaches have their own benefits, the use of other 'fit for purpose' approaches may be more motivating, engaging, inclusive and efficient.

Learning and teaching aims

Teaching, like research, is a purposeful activity. Planning for teaching (and research) is based on intentions, also variously described as goals, purposes, objectives and aims. Expressing aims and learning outcomes for teaching involves the same process as describing the purpose and procedures for a research proposal. They contribute logical starting points for unit design. So, once we are clear about what we want to achieve we can then make decisions about how we will achieve it.

At Macquarie University, learning and teaching aims is the term used to describe the broad, general expressions of intention or purpose and can include those that are lofty and noble as well as the more mundane and pragmatic. They provide guidance on the overall direction or thrust of the unit and what it contributes to the student's overall degree programme of study. Thus, statements of unit aims are general statements formulated in clear language to express the nature and direction of the topic and are:

- Significant and worthwhile
- Clear and unambiguous
- Attainable in terms of available facilities and resources
- Achievable (through reasonable effort by all students) and able to be evaluated.

Learning outcomes

At Macquarie University, expectations of what students **will learn** are conveyed by stating **learning outcomes**. Learning outcomes are those which are **assessed** in measurable ways and are derived from aims.

Examples of lead statements that precede a list of learning outcomes are:

It is expected that as a result of work in this unit/topic, students will ……

It is expected that on completion of this unit/topic, students will have……

On completing this unit/topic, students will be able to……

Bloom's Taxonomy of Educational Objectives (revised by Krathwohl et al, 2000) can be used as a tool to help formulate statements of objectives and outcomes. The taxonomy presented here identifies six levels of complexity of thinking that students will engage in when asked to do particular things (for example, in class or in assignments). In the table, Bloom's objectives (expressed here as unit aims) are linked to what students will be able to do, in other words observable behaviours, at each of the levels.

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Aims	Learning outcomes
Remember	Recognise, recall, identify, retrieve, name
Understand	Interpret, paraphrase, translate, represent, clarify Exemplify, instantiate, illustrate Classify, categorize, subsume Summarize, abstract, generalize Infer, extrapolate, interpolate, predict, conclude Compare, contrast, match, map Explain, construct models
Apply	Execute, carry out Implement, use
Analyze	Differentiate, discriminate, select, distinguish, focus Organise, outline, structure, integrate, find coherence, parse Attribute, deconstruct
Evaluate	Check, test, detect, monitor, coordinate Critique, judge
Create	Generate, hypothesize Plan, design Produce, construct

Summary

Aims = what the teacher will do and = what will be evaluated

Learning outcomes = what students must demonstrate and = what will be assessed

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Learning outcomes represent the translation of aims into specific, tangible, attainable learning achievements, usually expressed as observable behaviour and reflecting what students will be able to do or accomplish.

Assessment design principles

1. Assessment design ought to foster learning congruent with the aims of higher education and reinforce these characteristics. Learning outcomes appropriate to higher education include:

   - Higher order thinking: interpreting, translating, problem solving, critical reasoning

   - Connection to the real world: application of theory to practical "real life" situations

   - Capacity for team work, negotiation and collaboration: ability to work and converse with other students, teachers and discipline experts

   - Metacognition and self awareness: knowing what you know, knowing what you don't know, knowing how to learn

   - Research capacity: knowing how facts come to be facts and how experts proceed in the discipline

   - A disposition for life long learning: increased motivation to be active learners and an interest to continue to be consumers of research and further education.

2. Assessment design ought to contribute to the development of the Macquarie University Graduate Capabilities which represent a mix of cognitive capabilities, personal dispositions, and interpersonal or social dispositions. While it is clear that the capabilities cross these categories, they have been structured below into the category in which they are most seen to contribute. Acting with integrity underpins all these capabilities.

Macquarie University Graduate Capabilities

Cognitive capabilities	Discipline Specific Knowledge and Skills Critical, Analytical and Integrative Thinking Problem Solving and Research Capability Creative and Innovative
Interperson-al or social capabilities	Effective Communication Engaged and Ethical Local and Global citizens Socially and Environmentally Active and Responsible
Personal capabilities	Capable of Professional and Personal Judgement and Initiative Commitment to Continuous Learning

3. Assessment design ought to **be inclusive**, making sure that the design of assessment does not privilege one group of students at the expense of another and making sure that with appropriate effort all students have the opportunity to be successful. Here are some strategies that support an inclusive approach to assessment design:

   - Allow for students to plan ahead. Students who have special requirements due to mobility, sensory or social restriction need to have advance notice to be able to seek support for reasonable adjustments. Knowing how they will be assessed in advance enables them to access support in time.

   - Provide choice. If choices can be provided in the types of assessments a student might undertake, as long as they align with the stated learning outcomes, students can select from the choices to account for their own mobility, sensory and social restrictions and not be limited by the need to negotiate accommodations.

   - Exploit the potential and mitigate the constraints of the technologies employed in assessment.

   Visit the Macquarie Accessibility Services website for support and useful resources.

4. Assessment design ought to **be efficient**, making sure that the design does not unnecessarily increase or overload students or academics in activities that do not make a positive contribution to the achievement of high quality learning outcomes. For example, laboratory reports may not really need to be 'marked' every week. Students might get feedback in the lab over two weeks regarding their performance and then be graded on the third week on their progress, improvement and uptake of advice from teachers and peers. Equally, if students are expected to keep reflective journals, it would be burdensome to collect and read the journals regularly. Instead, requiring students to submit several brief (300-500 words) 'personal learning statements' over the course of the semester with references to their reflective journal engages them in synthesising their learning from the journals.

5. Assessment design needs to comply with the **Macquarie Assessment Policy** that outlines general principles, issues related to addressing students' special needs and workload and the minimal requirements for assessment design.

   The Assessment Procedures document, located at http://www.mq.edu.au/policy , specifies the following minimum requirements for unit outlines:

   - at least three assessment tasks that require more than one mode of performance and that address higher order thinking capability (or if the assessment is a large task, it should be disaggregated into stages for assessment)

   - inclusion of an early, low risk diagnostic task to provide feedback for students and teachers to address likely learning challenges

   - description of the assessment requirements, their relative weightings and the methods for grading

   - description of the type and timing of feedback that will be provided

- if participation is to be assessed, a description of how it will be determined and how it is justified in relation to learning objectives

- how the workload for the assessment requirements is calculated based on the amount of time required to master both the assessment mode and the content.

6. Assessment design needs to reveal the **coherent interconnections** amongst courses, units, assessment and learning outcomes, helping students to see the big picture. Remember that while you experience teaching at the unit level, students experience an entire course. Unit designs often fail to assist students to see the links between individual units and the course as a whole. Identify the links between the assessment and the unit, between the unit and the course, and between the various units within the course.

7. Assessment design should reflect **developmental learning** with assessments of increasing complexity. The challenge and complexity of assessment requirements should change throughout the whole course i.e. from first year level through to third year level. It is not necessary to assess all skill levels for every skill needed every year. However, it is assessment demands that will maintain the continuous development of newly acquired capacities and should help to increase complexity and develop expertise across the whole course.

8. Assessment design should include **authentic assessment** tasks. By linking assessment to the "real world" and anchoring assessment in real life scenarios, students are more likely to understand the relevance of a particular topic and the associated assessment method. Assessment is regarded as authentic if it is representative of students' capacity to perform in a broadly meaningful setting. Authentic assessment tasks typically entail collaboration with others, are seen as worth practising for, are enabling, contextualized and complex, and involve students' own research or use of knowledge.

9. Assessment design should explicitly encourage, guide and reward **academic honesty**, by "designing out" the opportunities for academic dishonesty, including plagiarism, collusion, and cheating. Some strategies that can be used are:

- Address the issue of academic honesty in all level one units, by explaining and demonstrating the ways to attribute and use the knowledge and work of others in assignments.

- Specify appropriate citation practices as one of the learning outcomes.

- Give students in-class opportunities to practise the skills of citing.

- Do not accept or grade assignments until students have cited properly.

- Educate students about the reasons behind the attribution of ideas and the need for a culture of academic honesty.

- Establish a departmentally agreed stance on the education and maintenance of academic honesty.

10. Assessment design can incorporate on-line and other technologies to enhance the learning opportunities and student engagement. On-line technologies offer many opportunities for students to carry out their learning and assessment in ways that develop their technical literacy and overcome constraints of time and place. Some of their group collaborations can be carried out on-line instead of trying to find common times on campus. The teacher can 'drop in' to on-line conversations to offer advice and formatively review the success of the group processes with the students. Equally on-line technologies can benefit teaching and the administration of assessment.

Choosing assessment methods

Of the many methods of assessment in use, the main methods typically used have their own benefits as well as limitations. For this reason, the assessment design of a unit of study should include diverse assessment methods, taking account of both their benefits and limitations.

Type of assessment	Benefits	Limitations
Regular practical work	• Keeps students "on task" • Encourages students early rather than later • Formative in nature as there are opportunities for students and teachers to make adjustments • Can encourage application, translation and interpretation of concepts learnt	• Can be time consuming for teachers • Can be seen as a "hoop jumping" exercise if not used formatively
Final Exams	• Assurance that the product belongs to the student • Assurance that students have attained the knowledge, skills and dispositions tested in the exam • Less time-consuming to mark than extended writing and thus relatively economical	• Merely summative • A measure of "poise" i.e. a capacity to recall information under stress • Often reproduction rather than transformation of information because of time limits

Essays and extended writing assignments	• Opportunity to develop an extended argument • Encourages depth of learning • Opportunity to develop capacity to interpret, translate, apply, critique and evaluate • Opportunity to problem pose and conduct inquiry • Opportunity to explore beyond the boundaries of what is known	• Time consuming to assess • Subjective assessment • Often occurs at the end and leaves no opportunity for students to make use of the feedback • Often one-off and fails to require students to make note of, and utilise, feedback (value added)
Field reports	• Authentic form of assessment • Develops observation and recording skills • Requires organisation skill	• Costly to supervise • Difficult to timetable • Need to consider ethical and safety issues
Research article review	• Requires interpretation and evaluation • Opportunity to understand how experts proceed	• Students need to be taught how to review
Group Work	• Encourages collaboration, co-operation and communication • Encourages independence by students • Opportunity for authentic skill development	• Difficult to assess individual input • Time consuming for students to organise • Time consuming for staff to prepare students for successful groupwork • Can disadvantage students if groupwork is not well supported
Portfolios	• Can be used to demonstrate progress towards, and achievement of, topic or course objectives • Encourages understanding of complexity of professional roles • Enables synthesis of what students have learnt across a number of topics • Capacity to use new understandings in novel ways in unpredictable work contexts • Valid and authentic assessment as they can include real world tasks • Focus on higher order thinking • Students have to accept a high degree of responsibility	• Needs careful framing of the requirements to ensure judicious selection and interpretation of material • Consistency between students is low • Time consuming for students to prepare • Time consuming for teachers to assess
Class presentations	• Students are motivated to perform well	• Time consuming for all students to present

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		individually
	• Can encourage group cohesion and collaboration • Can enable peer feedback	• Can be traumatic for some students • Evidence for assessment can be transient unless recorded • Difficult to avoid subjective bias in assessment
Participation in learning activities	• Can encourage more active engagement in learning • Can be used to foster more cooperative and collaborative learning	• Assessment criteria need to be very clearly stated • Can encourage dominance by a few in unproductively competitive behaviour • Can be overly subjective to assess

Designing for giving feedback

Feedback to students on their learning efforts is crucially important to their learning. To be effective, feedback needs to be designed into the teaching and assessment process. Feedback ought to enable students to improve their future efforts. As a result of feedback, students should be able to identify how to improve their conceptual understanding of the subject, their approaches to learning tasks, their capacity to apply knowledge to novel contexts, and so on. Equally, feedback should assist them in developing their metacognitive awareness of making these improvements in their learning. When it is clear that students are not learning from feedback, it may be as a result of:

- assessors' feedback being little more than editing and therefore not giving students a clear message about what they must do to improve

- students not reading or taking the advice that is given and/or not being required to do so.

Providing feedback that is useful can be time-consuming and expensive. Therefore, in designing the assessment process ensure that you account for efficient ways to provide high value, focused feedback and require students to utilize the feedback and provide evidence of having done so. There are many efficient ways of placing feedback at the core of the assessment design, for example:

- Designing feedback rubrics for all assessors at the time of designing the tasks

- Designing peer and self evaluation rubrics for students to use prior to submission of their work

- Requiring students to nominate the nature of the feedback they are seeking

- Requiring students to indicate in subsequent assignments how they have used the feedback from the prior assignment.

Designing for self / peer assessment

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Self and peer feedback are very powerful strategies to engage students in learning and developing their capacity to reflect upon and critique their own learning and skill development. This capacity for students to reflect "meta-cognitively" is one of the single most important success factors for learning. Knowing what you know and what you don't know and how to go about learning is critical to success at university. Some students come to university-level studies already possessing metacognitive awareness, while other students have further to go in developing it. Building in a need for students to critique their own performance and the performance of others is a way to encourage the development of their meta-cognitive capacity.

It is important to note that self and peer assessment and feedback does not necessarily include grading. The greatest value is for students to notice what is important, to be able to evaluate their level of performance and to consider what actions need to be taken to improve it. Even if there is to be a student contribution towards grading, it is important to design in a moderation responsibility for the teacher.

Setting assessment standards

Standards are relatively stable descriptions of the qualities of performance or learning products that describe "how well" the assessment task was carried out and at best describe an orderly development of quality. Standards are established by consensus-based processes that yield guidelines, rules and characteristics for their interpretation. Some professions and disciplines have established by consensus broad descriptions of competencies that are expected to be observed in graduates. It is the role of unit convenors to disaggregate these and distribute them developmentally across the learning outcomes of the units comprising the degree programme, ensuring that the assessment design aligns well with these outcomes.

Designing for grading and moderating

Grading students' learning products and performances entails a considerable degree of interpretation. Judgements made about students' learning performances on complex learning tasks (such as those that should typify university level courses) are notoriously unreliable, and have the potential for being biased. They are also dependent upon a teacher's acquired professional knowledge and experience of assessing, awareness of the limitations of their own judgements, and pedagogical knowledge.

As a task, interpreting and grading student learning, is essentially a human enterprise that is technically demanding and engendered with ethical, social and political dilemmas. Grading is a high stakes activity that requires careful design and prior planning to ensure consistency, accuracy and that the grade is re-presentative of a student's true capabilities. Grading can be carried out componentially, with various attributes of an assignment being weighted according to their relative importance, or holistically using an impressionistic approach grounded in professional judgement. Either approach or a combination of both is reasonable provided the outcomes are consistent and transparent.

Strategies for planning effective, valid and reliable grading within the assessment design include planning to:

- **Ensure intra-grader reliability:** for example, by an assessor returning to the same piece of work over time to check on consistency in the focus and outcome of the interpretation process

- **Examine inter-grader consistency:** for example, by including a standardized item for assessment that all assessors grade to expose and reduce inconsistencies across markers

- **Support the induction of new markers:** for example, by experienced assessors mentoring new assessors into the role

- **Ensure consistency in approach:** for example, by securing departmental agreement on the use, management and reporting of grades, particularly borderline grades (see Frisbie and Waltman, 2008).

A model for developmental assessment in first year

Taylor (2008) developed a model for assessment that specifically targets the needs of first year students. This model suggests that there should be three different phases for assessment in a 13-week semester. It seeks to balance the needs of the student with the busy schedule of academics, and not overload the academic with excessive marking.

- Assessment for transition occurs in the first 3-4 weeks of the semester. The assessment tasks are designed to engage students early, and should contribute to the final grade but have only a low weighting, and not involve too much marking time. Tasks might include a reflective activity or study plan or some diagnostic task.

- Assessment for development typically occurs between weeks 3 to 9. These assessment tasks are designed to provide significant feedback to the student and will involve relatively high marking time. They should make low to middle contributions to the final grade and might include draft essays, notes on a literature review or components of a portfolio. They might also include mid-semester quizzes for which there is extensive feedback.

- Assessment for achievement typically occurs anywhere between weeks 7 and 13 (or into the exam period). These tasks carry most of the marks for the final grade and may include final reports, essays or portfolios and examinations.

Throughout this scheme students should be encouraged to develop skills of peer and self-assessment. These are important capabilities but have to be taught and learnt.

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Macquarie University Useful Links

Macquarie Accessibility Services: support and links to useful resources
www.mq.edu.au/ltc/mqas/

Podcasts: Macquarie University staff talk about their assessment practices
www.mq.edu.au/ltc/for_staff/engage_students/

Macquarie University, Policy Central: http://www.mq.edu.au/policy/

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