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The Really Big Picture

In many ways, the most important conversation about curriculum design is one that we rarely have, buried as we are in the day-to-day detail of assessment, marking, and the preparation of lectures. It is worth pausing, though, and thinking about the purpose of a university education. For a significant number of Australians, the objective is the *testamur* – the piece of paper confirming that a graduate has earned a degree – because without a degree, many employment opportunities evaporate. For others, the purpose of a university education is something quite different. Literature on the theory of education lists reasons of social efficiency, humanistic learner-centered experiences, cognitive development, discipline-based scholarly activity, and social reconstruction. Given that the intention and underlying attitude of the curriculum designer will affect the way a program operates, it’s worth exploring each of these ideas.

The purpose of an education

1. **Social efficiency**: The purpose of education is to meet the needs of society by training (young) people to function as mature, contributing members of that society. Those who believe that this is the purpose of education will decide what successful graduates of a program ought to be able to do, and then, throughout the program, provide opportunities for students to practice each skill, with feedback, to the point of mastery. Assessment is designed to test how well students have mastered competencies or achieved learning outcomes. Vocational and professional programs (hairdressing, for example, or perhaps even professions like law) fit this category. The notion of mastery does not preclude creativity or excellent outlier practitioners.

2. **Humanistic learner-centered experiences**: The purpose of education is to provide students with intrinsically rewarding experiences to enhance their personal development, enabling them to achieve self-actualization. Those designing such programs will integrate the cognitive, affective, and psychomotor domains; content is selected according to student interest; learning is experiential; and assessment is designed to explore the extent and depth of student learning. In this category, you would find many performing arts courses, programs for students undertaking independent research, and constructivist programs designed on discovery learning principles.

3. **Cognitive development**: The purpose of education is to provide a learning environment that allows students to construct their own knowledge, with a curriculum designed to sharpen intellectual processes and develop cognitive skills that can be applied to anything. In this paradigm, discipline knowledge is instrumental, and students are expected to be able to transfer skills learnt in one subject area to others. For curriculum designers working within this framework, the natural order of development in the individual is the most significant and scientifically defensible basis for determining what should be taught at each stage of development. Assessment is designed to check on cognitive development and students’ achievements in relation to the established norms for those of their age and stage of development. Most school curriculum falls into this category.

4. **Social reconstruction**: The purpose of education is an improved (new and more just) society. In programs of this nature, the needs and betterment of society are placed above those of the individual. School is an agent for change, and education needs to be relevant to both societal and individual needs. Knowledge in these programs is a vehicle for self-awareness, consciousness-
raising, and political awareness. Assessment reflects these values. These kinds of programs are often subversive in nature, and are frequently the kinds of programs that open up education for people who have not previously had access. Here, it is worth bearing in mind recent innovations by large north American institutions. For example, some years ago, MIT made freely available all the materials developed for its courses. Recently, it has announced that students who have been using these materials for self-study and improvement will be able to pay to take invigilated exams on the material and those who pass will receive some form of accreditation from the organization. Stanford academic Koller’s Coursera initiative is designed to make education more freely available. Are these examples of social reconstruction programs?

5. **Discipline-based scholarly endeavour**: The purpose of education is to teach students discipline knowledge and to induct them into the discipline, teaching them the language and culture of the discipline. As they move through programs designed on this premise, they enhance their understanding of the world using the lens of the discipline. The focus of the program is on content knowledge, the skills required by the discipline, an understanding of the nature and type of research questions recognized as valid within the discipline, and the ontology and epistemology of the discipline. In a program of this kind, judgments about students’ achievements are based on an assessment of the degree to which they have come to resemble an expert in the discipline, and whether or not this is appropriate for their stage of development. Most university education falls into this category, one way or another, including many programs described as “research-led education”. (Eisner & Vallance, 1973; Print, 1993; Posner & Rudnitsky, 1994; Smith, 1996, 2000; Friere, 2000; Schiro, 2008)

In reality, no single program, whether offered in a university, VET college, school, or by a private provider, fits neatly and entirely into one category, although certain programs will draw more heavily on one model than the others. University teaching and curriculum design, for instance, is influenced – even now – by the notion of discipline-based, scholarly endeavour to a much greater extent than any of the other options. It is important to remember, however, that assumptions held by university academics responsible for the design of a program are not always the same as those held by those enrolling in the program. A program designed for one purpose may be taken by students with entirely different intentions. Imagine, if you will, a university student (whose primary objective is to improve her chances of obtaining a specific job) who is enrolled in a research-intensive program designed purely to extend the body of knowledge for a particular discipline. Might such a person exist? What are the consequences for the answers she provides in the standard student satisfaction questionnaires administered by the university throughout her studies and after she graduates?

**The purpose of a university**

What then, is the purpose of a university? An idealist would say that a university exists to:

- Extend the boundaries of the known, to create knowledge new to humanity using the tools and techniques of the disciplines,
- Make discipline-specific bodies of knowledge (including newly discovered knowledge) available to all humanity, through publications and the mass media,
- Provide discipline-specific programs of education, and thereby to induct novices into the role of custodian-expert-researcher of the knowledge of the discipline, and
Graduate specialists who have the skills and expertise to seek out, commission, contribute to, assess, and use this discipline-specific knowledge to solve the day-to-day problems of society.

A pragmatist would say that a university (also, or perhaps even only) exists to provide accreditation and certification: to provide guarantees that its graduates are competent and have demonstrated suitable achievement in their chosen area of expertise. If this comes to be the agreed primary purpose of the institution, then it is possible that universities will become little more than examination centres, filled with academics writing tests and passing judgment on the fitness of applicants to be stamped “GRADUATE.” Time will be spent on actually teaching those applicants will be minimal; rather, such applicants would take personal responsibility for preparing for their examinations, by seeking out knowledge in other ways (personal research, reading, and perhaps participating in freely available open, online courses, e.g. MOOCs) before applying to sit the relevant examination. While this is a dire picture, there is no doubt that the role of the university-as-certifier is an important one.

It is the responsibility of a university, then, to provide programs of study which prepare both academic researchers (who will stay within the walls of the university) and graduates who will take the knowledge of the university and apply it to the problems of industry and government (those who will have careers outside the walls of the university), and to provide assurance that this preparation is sufficient to guarantee an appropriate level of expertise in these areas.

**University teaching: a measure of quality**

How does a university teacher know that his students have achieved an appropriate level of expertise? What qualifies him above others to make this judgment? This ability to make a professional judgment, to assess the quality of a person’s work, is intrinsic to the role of university academic.

Each university academic who sits in judgment of the work of his students and his peers has an internal measure of quality work in his discipline. This measure of quality has been formed over years, and is based on every encounter he has had with members of his academic tribe: every discipline-based conversation, every conference presentation, every moderation discussion, every academic paper reviewed for a journal, every student script and every other discipline-related encounter. The measure is under constant review, as he continues to engage in his discipline. At one end of this measure is the complete discipline novice: the school-leaver who has just enrolled in her first course in the discipline. At the other end are the very best practitioners and researchers and teachers in the discipline. Each piece of work assessed by the university teacher is evaluated against this measure.

In evaluating work produced within the discipline (by either student or peer), the university teacher asks two questions:

1. In terms of overall quality, how does this piece of work hold up against my measure?
2. Is the quality of this work appropriate, given the stage of development of the author, the audience for which it was created, the context in which it was developed, and the purpose for which it was created?

They should probably also ask a third:

3. Would my colleagues agree with my assessment?

The same measure and the same questions are used whether the work is from a junior undergraduate or a peer. That’s why university academics say things like “I can’t recommend this article for publication; I would fail it if it were submitted for as a third-year assignment” and “This student’s work is outstanding; with a little work it could be published”.

So, every university academic has an internal measure of quality, and it is against this internal measure that student work and the work of peers is assessed. However, this internal measure itself needs to be constantly monitored and calibrated, through participation in
conferences run by the discipline’s professional bodies, through course-based moderation activities, and through program reviews, among other things.

**Flexibility of design**

Einstein is reported to have said, “Everything should be made as simple as possible, but not simpler”. The model of curriculum design outlined in this booklet is designed to be just that. It emerged from a search for a very practical, comprehensive, and easily applied model of curriculum design, one that can be as readily understood by someone new to curriculum planning as by someone who identifies in the model echoes of earlier conceptions of course and program design: product and process models, instructional design models, more recent models from distance education, blended learning, and resource-based teaching, and the constructive alignment model for higher education (Biggs & Tang, 2007). While it is most useful when used iteratively, it can be used for more linear approaches to curriculum planning. It is flexible enough to facilitate conversations about curriculum design with academics from different epistemological positions and it can be used to explore theories of learning.

In essence, it touches on the key elements of curriculum design:

- learning outcomes at minor, major, course, and program level,
- graduate attributes, capabilities and qualities,
- coverage of content,
- evaluation,
- teaching and learning activities, and
- assessment.

**The Teaching-Learning Flow**

Before we look at this model of curriculum design, let’s look at the interactions between the university academic teacher and his or her students over the duration of a university course. Richard James calls them transactions. It is these interactions or transactions which form the core of university teaching, even though many university lecturers describe their curriculum by listing the topics they cover. In a recent newspaper article in which James is commenting on Massive Online Open Courses (MOOCs), he wrote:

“But higher education is, after all, education. It’s not merely about distribution of content, it’s also about multiple transactions between learners and providers. Higher education involves not only access to learning materials but tutorial support, guidance, stimulation and encouragement too. These aspects of education are not easily delivered on a vast scale. Higher education – well good higher education at least – is deeply interactive.

Ultimately, of course, higher education is also about the assessment and certification of learning. Given present technological capabilities, while content may be made freely accessible, the processes of assessment and certification are still labour-intensive and the opportunities for scalability remain limited.

If the preceding analysis is accurate then the disruptive effective of massive online open courses may be mainly on one dimension of academic work, the delivery of content. This alone will have a substantial impact, for the knowledge and theory underpinning course content is the intellectual centerpiece and the cornerstone of academic values.” (James, 2012)
A course might be delivered over the span of a semester or intensively in a shorter time frame, it might be delivered entirely face-to-face, in a blended mode that combines face-to-face teaching with online activity and a range of resources in different media, or in a distance mode which does not require synchronous attendance either online or in a single geographical space. In a sense, these aspects of delivery are secondary to the essence of teaching and learning and curriculum design. Considerations of time and space (where and when students are engaged in learning) will influence the kind of learning activities, the types of teaching strategies, and the nature of the technologies used in the curriculum design, but they don’t affect the flow of the teaching-learning process – the interactions and transactions. As illustrated in the Teaching-Learning Flow model in Figure 1, teaching and learning follows a pattern independent of time and space. Teachers present *(tell)* the declarative knowledge of the discipline, and *show* students how to use this knowledge, sometimes by *modeling*. Students *practice* (learning tasks), *check* (formative feedback), and *do* (summative assignments). Teachers *judge* summative assignments and award marks for them that contribute toward the final grade.

**Figure 1: The Teaching-Learning Flow**

**TEACHER activities**

**STUDENT activities**

During the “learn” phase, which is explored in more detail later in this document, a teacher facilitates learning experiences (teaching and learning activities) that give students opportunities to practice their new skills, apply their new expertise, and use their new knowledge to analyze situations and solve problems. They get time to check on how well they are able to do these new things, and the teacher provides them with (formative) feedback on their progress. Finally, after they have learnt the body of knowledge for the course (or a sub-section of the course), they do something that provides the teacher with the evidence he or she needs to judge how well students have learnt the new material; that is, to judge whether or not the knowledge and skills the student has acquired are sufficient to pass the course.

We’ll return to this idea of interactions and transactions in university teaching, in the section on Teaching and Learning Activities.

**Research-led teaching**

With this Flow in mind, let’s look at the notion of research-led teaching or research-led education. There is a perception that “research-led” education is always designed and delivered by research-active university academic staff, and that merely by allocating teaching duties...
to research-active staff, the institution has guaranteed that students will get a research-led education.

Angela Brew has a slightly different perspective. In 2002, she wrote:

“While the term “research-led teaching” now trips off the tongue of many academic managers, and is becoming accepted as a positive trend to develop, many academics I have spoken to have a very narrow understanding of the concept and how to develop it. Indeed, … I have frequently found confusion between research-led teaching and researcher-led teaching; the assumption being that because the university is full of researchers, its teaching is, ipso facto, research-led.” (Brew, 2002)

For Brew, “a department or faculty may be research-led if debates and discussions within the faculty take place routinely on such questions as: What can our disciplinary knowledge and theories contribute to our understanding of teaching and learning issues? What is the nature of knowledge in our subject/s? What can the methodological approaches we adopt in researching our subject tell us about teaching and learning? Students can be routinely involved in such discussions.” (Brew, 2002)

Healey and Jenkins (2009) have developed this idea further. They write:

“… our goal … is to move more curricula in the direction of developing students as participants in research and inquiry, so that they are producers, not just consumers of knowledge … For us the key to developing undergraduate research and inquiry is to mainstream it and integrate it into the curriculum for all students” (Healey and Jenkins, 2009)

Figure 2: The nature of undergraduate research and inquiry (Healey and Jenkins, 2009)

Their view is that although all four ways of engaging with students with research and inquiry are valid and valuable and curricula should contain elements of all of them, “in much of higher education relatively too much teaching and learning is in the bottom half of the model, and … most students would benefit from spending more time in the top half” (Healey and Jenkins, 2009). This is not to suggest that Healey and Jenkins value one aspect of their model more than the other. In fact, they point out that they would not want
students to spend all their learning time in the top half (research-tutored and research-based). For them, effective courses and programs incorporate all four elements.

All university teaching is research-informed, in that all university teachers draw on the published research of their discipline in designing courses – but the same could be said of school teaching or vocational education and training. Universities, more than other educational institutions, teach students how to be more than consumers of knowledge. University students, in research-led programs, learn how new knowledge is constructed or discovered, how to frame research questions, how to assess the quality of research, and how to use the outputs from research – but as Brew has pointed out, putting researchers in front of students does not, in and of itself, cause curriculum to be research-led. How then, do university teachers introduce elements of research-led education into their coursework programs, and when should they start doing it? In a paper prepared in 2012 for the ANU University Education Committee, Howitt, Roberts and Wilson outlined one approach taken by Wilson and Howitt in a program in which students learn about research in the discipline area, how to do research and through research.

1. **Learning about research**: To ensure that their students are learning about research, they design learning experiences which address questions about research: What types of research questions are seen as valid in the discipline? What are the outcomes and products of research? What are accepted as valid processes of research? What is the social/cultural context? They provide feedback which focuses on students’ critical thinking rather than their content knowledge, thus inducting students into the discipline by guiding them to begin thinking like a researcher in their field.

2. **Learning how researchers do research**: When they are focusing on the methodologies used in the discipline, and on the skills students need to be developing, they centre course design on teaching students how to identify and frame questions, techniques used in the discipline to address questions, ways to evaluate problem-solving or research processes, and discipline-specific methods and techniques. They give their students practice in applying their new skills to solving problems for which we have already found answers. Students follow in the footsteps of those who have gone before them, replicating their discoveries.

3. **Learning through research**: After some time, students in this program arrive at a point where they will begin to experience for themselves how research leads to new understandings. At this stage, Wilson and Howitt design learning activities which require the students to use research methodologies to generate knowledge or understanding that is new to the student, or – more dramatically – new to the discipline.

In their program, Howlitt and Wilson cover all four aspects of research-led teaching outlined by Healey and Jenkins.

This issue of research-led teaching is of increasing interest. For example, yet another – perhaps slightly less user-friendly – framework for research-led education has been developed by Willson and O’Regan at the University of Adelaide: *Research Skill Development Framework: a conceptual model to make explicit the incremental and cyclic development of student research skills*.¹

Designing a curriculum for a research-led program, then, requires the designer / academic / lecturer to have an overall plan to engage students in activities where they first copy already-completed research (in order to learn and practice the skills used by a researcher), before embarking on the process of identifying a research question that would be deemed valid by the discipline, working out how to find an answer to the question, and then investigating the question.

¹ The full framework, and more information about it, can be found at [http://www.adelaide.edu.au/rsd/](http://www.adelaide.edu.au/rsd/).
The Bones Model

The Bones Model provides teachers with a way of describing the activities associated with the flow of teaching and learning and makes explicit the links and alignment between the elements of the curriculum.

When you begin to design your curriculum these are the elements you need to take into consideration: program learning outcomes, course learning outcomes, graduate attributes, capabilities and qualities, content (the topics you intend to cover – the declarative knowledge), evaluation, teaching and learning activities (opportunities for students to apply their new declarative knowledge to solve problems, analyze case studies, and demonstrate their understanding), and assessment (the tasks and artefacts you use to judge how well students have achieved the course learning outcomes).

You need to be aware of alignment. That is, do your learning outcomes at program level align with learning outcomes at course level? Are the descriptions of graduate attributes, capabilities and qualities echoed in the descriptions of learning outcomes at a program level? Is it clear that the assessment strategy is designed to collect evidence of how well students have achieved the course level learning outcomes? If your answer to any of these questions is in the negative, you can be sure that your curriculum is not aligned and will need to be re-worked.

Figure 3: The elements of the Bones Model

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The curriculum design process

Draw a diagram of your process of curriculum design, incorporating all of these elements. Is it linear or iterative? When, and in which order, do you address each element? Have you, in the past, ignored some of the core elements when putting together your curriculum documentation? Compare your diagram with Figure 3: The elements of the Bones Model.
In designing curriculum the lecturer deals with the questions outlined here:

1. **Course Content:** What information needs to be covered in the course? What are the sources of this information, e.g. published and unpublished research, review literature, websites, multimedia material? How can the information be most authentic, e.g. case studies, current research findings from lecturer or colleagues, real-life projects?

2. **Program Aims, Goals, Objectives:** Program learning outcomes provide the touchstone for all course learning outcomes, especially for core courses in minors and majors. These are the goals for the whole Program. How do Program Aims mesh with the Australian Qualifications Framework descriptors?

3. **Course-level Intended Learning Outcomes:** "Upon successful completion of this course, students will have the knowledge and skills to …" How do course-level learning outcomes align with Program Aims and link to graduate capabilities and qualities? What is the purpose of the course? The learning outcomes shape the kinds of learning and teaching activities undertaken in the program.

4. **Teaching & Learning Activities:** Where and when will students learn? What learning activities, processes and events will be most effective and efficient in giving students the necessary learning experiences to absorb the course content, apply their newly-acquired declarative knowledge, complete activities that demonstrate their functioning, procedural, conditional, reflective and metacognitive knowledge, and achieve the course outcomes? These are the learning activities that occur throughout the semester: group activities, field trips, laboratory work, online learning activities, etc. They are the activities that provide opportunities for students to practice applying their new declarative knowledge and to rehearse the tasks they will complete for the summative assessment. These are the activities that provide opportunities for the teacher to guide the students’ learning. It is in the activities undertaken by students that they ought to learn what the current research in the discipline is, and how to develop research and inquiry skills and techniques, how to engage in research discussions, and how to go about research and inquiry.

5. **Assessment:** What kinds of assessment will provide authentic measures of how well the student has achieved the course learning outcomes? What kinds of assessment will demonstrate that students are able to apply newly-acquired declarative knowledge in completing activities that test functioning knowledge? What are the relevant marking criteria and how do these reflect commonly understood academic achievement standards – for program, course, discipline, profession, and university? Does your assessment strategy provide evidence of how well students have achieved stated learning outcomes? (If not, you will need to change it.)

6. **Graduate Attributes, Capabilities, Qualities:** What will graduates be like? What will they be able to do? What skills and expertise will they be able to list on their résumé? Are these characteristics commonly understood by everyone teaching in a program, by employers and parents, and by the University community?

7. **Evaluation:** How and when will the program / course be reviewed or evaluated? What will it be judged against? What moderation processes are in place? When is feedback sought from students? How do student comments inform the evolution of the curriculum?

More information about writing learning outcomes, assessment, evaluation and technology in education, is available later in this document. For more ideas about teaching and learning activities, visit the [University Teaching: strategies and techniques](http://university-teaching.blogspot.com.au/) blog.

**Constructive alignment**

Constructive alignment, according to Biggs, has four major steps:

1. Learning outcomes are defined
2. Teaching and learning activities are designed to ensure that students are taught the skills and expertise they need to meet the learning outcomes, given opportunities to practice applying their

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new capabilities in solving problems (both familiar and unfamiliar), and provided with formative feedback designed to assist them to be even more successful at completing similar tasks in the future.

3. Students are assessed, by completing tasks that provide the teacher with the evidence they need to evaluate how well students have met the learning outcomes.

4. Student work is judged and given a grade.

(Biggs & Tang, 2007)

This idea of alignment manifests at two levels of curriculum. The first relates to the idea that the purpose of assessment is to collect evidence of how well students have achieved learning outcomes at a course level. This is discussed in more detail later in the section on assessment.

Figure 4: Alignment at course level

At course level, learning outcomes align with teaching and learning activities align with assignments and examinations align with marking criteria. Teaching and learning activities (designed with learning outcomes in mind) prepare students to complete assignments and examinations (which are marked according to criteria derived from the learning outcomes).

The second relates to overall alignment of the elements of a program. Figure 5 shows how each course, each major and each minor contributes to a student’s achievement of the learning outcomes at a program level.
Figure 5: Alignment at a program level

A well-designed course in a well-designed program hangs together elegantly.
Learning outcomes are goals that describe what successful learners will be able to do at the end of a course of study. In a university course, these will include higher order skills like critical analysis and the ability to construct and articulate elegantly an argument based on appropriate evidence.

Principles

1. The assessment strategy for a course is designed to provide evidence of how well students have achieved the learning outcomes.
2. The stated learning outcomes of a course align not only with the assessment strategy but also with the stated purpose and goals of the majors and minors and of the program/s into which the course fits.
3. Learning outcomes describe what students will be able to do once they have completed the course; they deal with functioning rather than declarative knowledge.
4. Learning outcomes describe what all students will be able to do if they have passed the course; it is the assessment strategy that will provide the evidence that allows the marker to differentiate between levels of performance.
5. Statements of learning outcomes include descriptions of how students will demonstrate both lower and higher order skills, with a focus on the latter.

Form

1. Each course needs 3-5 learning outcomes.
2. The statement about learning outcomes begins with the stem “Upon successful completion of the requirements for this course, students will have the knowledge and skills to …”.
3. Each learning outcome will describe a performance. Learning outcomes typically relate an action to the content taught in the course, describing how a student will demonstrate that he or she is able to apply the knowledge gained in the course, e.g. in solving a problem, completing a task, or analyzing or critiquing an issue or situation relevant to the course, the discipline and/or the profession. The performance described in the learning outcome will be observable and measurable.

Alignment

Does your assessment strategy align with your learning outcomes?

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3 *Declarative knowledge:* "... propositional ... knowledge refers to knowing about things, or 'knowing-what': knowing what Freud said, knowing what the terms of an equation refer to, knowing what kinds of cloud formation can be distinguished, knowing what were the important events in Shakespeare's life. Such content knowledge accrues from research, not from personal experience. It is public knowledge, subject to rules of evidence that make it verifiable, replicable and logically consistent. It is what is in the libraries and textbooks and is what teachers 'declare' in lectures."

*Functioning knowledge:* "... based on the idea of performances of various kinds underpinned by understanding. This knowledge is within the experience of the learner, who can now put declarative knowledge to work by solving problems, designing buildings, planning teaching or performing surgery. Functioning knowledge requires a solid foundation of declarative knowledge." (Biggs & Tang, 2007, p 72)

4 Lower order skills include those of knowing and understanding; higher order skills include those of applying, analyzing, synthesizing, and evaluating. (cf. Bloom’s Taxonomy)
Example

Here’s an example:

Upon successful completion of the requirements for this course, students will have the knowledge and skills to:

- Critique the notion of “alignment”;
- Compose statements of learning outcomes appropriate to the course, and
- Design an assessment strategy to collect evidence of how well students have achieved course learning outcomes.

Dimensions of learning

Be wary of using verbs like understand, learn, and appreciate in learning outcomes. Instead, write learning outcomes that describe performances that are observable and measurable. Well-constructed learning outcomes point towards the evidence you will require to judge whether or not students have learnt the content and acquired the skills you have covered in the course. As you are working in a tertiary institution, you will be setting goals (described in the learning outcomes) and collecting evidence (from summative assessment items) that emphasize characteristics like autonomy, unpredictability, novelty, creativity and the ability to reason, and skills of communication. Think about which dimensions of learning you need to cover in your course or program.
### Table 1: Dimensions of knowledge

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Useful verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Declarative knowledge</strong>: students are learning <em>what</em> (facts and principles)</td>
<td>Learning outcomes dealing with declarative learning fall into the categories of <em>knowledge</em> and <em>comprehension</em> in Bloom’s Taxonomy. They use verbs like <em>select, list, name, define, describe, memorize, label, identify, locate, recite, state, recognize, match, restate, paraphrase, rewrite, give examples, express, illustrate, explain, defend, distinguish, summarize, interrelate, interpret, and extend.</em></td>
</tr>
<tr>
<td><strong>Procedural knowledge</strong>: students are learning <em>how</em> (skills and procedures, critical thinking)</td>
<td>Learning outcomes dealing with procedural learning use verbs like <em>carry out, calculate, compute, operate, process, execute, follow, perform, use, utilize, practice, adapt, implement, demonstrate, determine, rehearse, and conduct.</em></td>
</tr>
<tr>
<td><strong>Conditional knowledge</strong>: students are learning <em>where</em>, <em>when</em> and <em>under what circumstances</em> (context-specific application)</td>
<td>Learning outcomes dealing with conditional learning describe student skills of decision-making and informed choice. Verbs like <em>choose, opt, select, apply, decide, and show</em> may be useful.</td>
</tr>
<tr>
<td><strong>Functioning knowledge</strong>: students are learning how to employ declarative, procedural and conditional knowledge to solve problems and function professionally (problem solving and critical thinking)</td>
<td>Verbs like <em>analyse, compose, re-work, argue, originate, hypothesize, develop, debate, diagnose, justify, design, combine, construct, produce, plan, create, prove, solve, invent, and organize</em> may be useful.</td>
</tr>
<tr>
<td><strong>Reflective knowledge</strong>: students are learning <em>why</em> (understanding oneself and others)</td>
<td>Verbs like <em>judge, speculate, imagine, model, discuss, critique, evaluate, consider, recommend, appraise, and compare</em> may be useful.</td>
</tr>
<tr>
<td><strong>Metacognitive knowledge</strong>: students are learning <em>how to learn</em> (directing and managing one’s own learning – or research)</td>
<td>Verbs like <em>reflect, predict, design, recommend, relate, and evaluate</em> may be useful.</td>
</tr>
</tbody>
</table>

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The very useful Bloom’s Rose – [http://en.wikipedia.org/wiki/File:Blooms_rose.svg](http://en.wikipedia.org/wiki/File:Blooms_rose.svg) – gives not only lists of verbs to assist those writing learning outcomes, but also suggestions for the kinds of artefacts that students might be asked to produce for assessment.
Budgeting the hours

Students studying any course will have a finite number of hours available to them to complete the requirements. For example, in a 13-week standard university course, students might reasonably be expected to put in 10 hours a week. If, therefore, the course requirements can't be completed in less than 200 hours, the students have been set up to fail. There will always be variations: some students will choose to spend more time on their studies than others, while others will need to spend less time than others to achieve acceptable outcomes. However, a prudent university lecturer will monitor this aspect of the course during the design and evaluation phases. Table 2 lists many of the activities that students will need to fit into the time available. You may wish to add others.

Table 2: Budgeting the hours

<table>
<thead>
<tr>
<th>Learning events and opportunities</th>
<th>Hours allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td></td>
</tr>
<tr>
<td>Tutorials and seminars</td>
<td></td>
</tr>
<tr>
<td>Web-based activities, e.g. online discussions, blogs</td>
<td></td>
</tr>
<tr>
<td>Assessable tasks and assignments</td>
<td></td>
</tr>
<tr>
<td>Peer discussions outside class time</td>
<td></td>
</tr>
<tr>
<td>Textbooks</td>
<td></td>
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<tr>
<td>Audio / video recordings</td>
<td></td>
</tr>
<tr>
<td>Required readings</td>
<td></td>
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<tr>
<td>Practica and internships</td>
<td></td>
</tr>
<tr>
<td>Optional and recommended readings</td>
<td></td>
</tr>
<tr>
<td>Non-assessable assigned activities and tasks</td>
<td></td>
</tr>
<tr>
<td>Examination preparation and revision</td>
<td></td>
</tr>
<tr>
<td>Audioconferences</td>
<td></td>
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<tr>
<td>Fieldwork</td>
<td></td>
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<tr>
<td>Site visits</td>
<td></td>
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<tr>
<td>Laboratory sessions</td>
<td></td>
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<tr>
<td>Library research</td>
<td></td>
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<tr>
<td>Activity associated with group tasks</td>
<td></td>
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<tr>
<td>Academic skills sessions</td>
<td></td>
</tr>
<tr>
<td>Learning events and opportunities</td>
<td>Hours allocated</td>
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<td>TOTAL</td>
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</table>
Assessment

“Assessment is a central feature of teaching and the curriculum. It powerfully frames how students learn and what students achieve. It is one of the most significant influences on students’ experiences of higher education and all that they gain from it. The reason for an explicit focus on improving assessment practice is the huge impact it has on the quality of learning.

Assessment is the making of judgements about how students’ work meets appropriate standards. Teachers, markers and examiners have traditionally been charged with that responsibility. However, students themselves need to develop the capacity to make judgements about both their own work and that of others in order to become effective continuing learners and practitioners.

Assessment plays a key role in both fostering and the certification of students. However, unless it first satisfies the educational purpose of ensuring students can identify high quality work and can relate this knowledge to their own work, the likelihood that they will reach high standards themselves is much reduced.” (Boud, 2010)

The assessment strategy for a course may be the most important element in any plan for learning, not only because it provides the evidence used by institutions as the basis for decisions about student progress and certification, but also because students take cues from it to guide their selection of learning strategies throughout the course and to identify opportunities for future learning.

A comprehensive assessment strategy will incorporate several aspects:

1. **Summative**: The teacher sets tasks for students to complete which provide evidence of how much students have learnt and how well they have learnt it. These are the tasks that are marked and on which final grades are based. Feedback, when it is provided, explains the mark.

2. **Formative**: The teacher sets tasks for students to complete which uncover gaps or misunderstanding in students’ current learning. These tasks provide opportunities for students to practice using their new knowledge, and attract feedback and guidance from teachers. Feedback, which ought to be provided for all formative tasks, assists students to complete future tasks more effectively and to a higher standard.

3. **Diagnostic**: The teacher sets tasks for students to complete that provide evidence of how much students already know, before they begin to tackle the course itself. The results of this type of assessment help both teacher and student to establish a baseline for learning in the course.

4. **Integrative**: This aspect of an assessment strategy draws together information about student learning and informs decisions students will make about how they are learning currently, how well they understand relevant (teacher-set) academic achievement standards, and where they will seek out learning in the future.

Some teachers work on the assumption that if it’s not tested or doesn’t count towards the final grade, students won’t do it. Some students work on the assumption that it if doesn’t count towards the final grade, they are wasting time if they do it. This appears to be borne out in discussions of the “hidden curriculum”, described as the difference between “the formal curriculum as stated in course documents and the informal curriculum constituted by staff expectations which are not stated explicitly but are nevertheless ascertained by students who will look for them”, and the need to align the summative assessment strategy with teaching and learning activities (Joughin, 2010, drawing on the work of Becker, Geer, & Hughes, 1968; Snyder, 1971, and Miller & Parlett, 1974; Anderson, 2001; Sambell & McDowell, 1998). However, it is very important for each student to attain an understanding of quality that is calibrated against the teacher’s standards (see, for example, Boud, 2010; Sadler, 2010; and Rust et al, 2003), and that can’t happen if they complete only the summative assessment. Teachers need to build formative assessment into their course, and students need to understand why it’s a good idea to practice tasks before they attempt the summative assessment.
Those designing assessment will need to consider whether they are setting tasks that are convergent or divergent. Convergent assignments are those which have one correct answer. These are tests that ask questions like “Can you name …?” and “Can you demonstrate the process of …?”. Divergent assignments require students to produce reasoned answers based on informed opinion and analysis. The former are much easier to mark, but can be limited in scope. Compare, for example, a multiple-choice quiz with a literature review, a cloze test with a critique, or a test of recall of established procedure with a test of problem-solving skills.

Convergent assessment is most useful when checking declarative knowledge: whether the student knows something. Divergent assessment, where there may be a difference of opinion based on interpretation, can be used to test the other dimensions of knowledge – procedural, conditional, functioning, reflective, and metacognitive: the extent of student knowledge and expertise. (Torrance & Pryor, 2001; McAlpine, 2002)

Assessment and gaps in student knowledge

Let’s start, then, with an assumption: when a student enrols in a course of study, it is because he wishes to learn something new. (There are exceptions to this, of course. For example, a student may have already mastered a body of knowledge and expertise, but require certification and formal recognition of that knowledge. For the purposes of this text, we will put those students to one side.) There is, therefore, a gap between what the student knows at the beginning of a new course, and what he needs to know by the end to finish the course successfully. A teacher’s assessment strategy is the plan she has for reducing this gap. Not all students will close the gap completely; for most courses, there is an acceptable final gap in knowledge. Those who still have the largest acceptable gap in their knowledge are the ones who scrape through with a Pass mark. Those who have closed the gap completely are the ones who graduate with the highest grades.

Designing an assessment strategy

In designing an assessment strategy, the teacher will address the following questions.

1. **Assumptions about existing learning**: Do all students have a suitable and similar foundation of knowledge coming into the class? Does that need to be tested? Will some students have some catch-up or revision work to do before they can tackle the course? Are there some students who will be able to skip some of the class and still achieve a high grade?

2. **Monitoring current learning**: How will the teacher check that students are on track with their learning for the course? How will students know that they are on track with their learning for the course? What learning activities will the teacher provide to assist them to learn the material of the course more efficiently and more effectively? How will the teacher provide feedback to students on their learning progress?

3. **Grading achievement of current learning**: How will the teacher judge students’ final achievements for the course? How will the teacher get the students to understand the standard against which she is measuring them? How does she help students to develop their own internal measure of quality?

4. **Guiding future learning**: What will the course provide to assist students in planning future learning and in being more effective learners in the future? Do students understand the
place of the current course in the program?

To start with, then, there needs to be a shared understanding of the knowledge students are required to bring to the course. This may require some pre-testing (diagnostic assessment). The teacher needs to provide a lucid description of the domains of knowledge that will be taught in the course (statements of learning outcomes). Throughout the program, the teacher needs to monitor student learning (formative assessment) and provide advice on ways that students could modify their learning strategies to become more effective learners (formative feedback). Students need to be monitoring their own learning, assessing their own learning abilities and problem-solving capabilities, ensuring that their work measures up to the teacher’s standards, and working out how they might enhance their ability to adapt their learning to future scenarios (integrative assessment). Finally, teachers need to make judgements about how well students have closed the gaps in their learning and how they measure up against relevant academic achievement standards, and document those judgements as marks and grades (summative assessment).

**Summative assessment**

When most people talk about assessment, they mean summative assessment, so let’s talk first of this dimension. At the end of a course, the teacher’s job is to assess how well students have achieved the learning outcomes for the course and to give them a grade based on this assessment. In making this judgement, the teacher will measure work produced by students against her personal professional standard, which has evolved over years of assessing the work of students, reviewing the work of peers, and monitoring professional practice in the discipline. She will assess the quality of the work and decide whether it is appropriate in quality for the student’s stage of development. That is, she will ask:

1. Compared to all the other papers I have ever encountered, how good is this piece of work?
2. Is the academic standard achieved by this student appropriate for his stage of development?

These judgements will probably be articulated initially as marks allocated to a series of assignments and examinations, and eventually as a grade. Students have a better chance of understanding their grades if they have begun to evolve a sense of standards and practice in the discipline and can see how their work compares with similar assignments from their own classmates and how it measures up against the work of experts in the discipline or profession. Students need help to do this, and studies that describe their preferences, e.g. assessment practices that are consistent and transparent, with clear guidelines about marking criteria, and early feedback (Poulos & Mahoney, 2008) demonstrate that they value assistance that helps them in achieving this understanding of teacher expectations.

In designing a summative assessment strategy, the convenor of a strongly-aligned curriculum is putting in place a process that facilitates the collection of artefacts or the observation of presentations that will allow her to make and defend (to peers) or explain (to students) this judgement. For students, the summative assessment strategy provides them with the opportunity to demonstrate how much they have learnt and how well they understand the culture, language, standards, and knowledge domains of the discipline in general and the course in particular. It also provides them with an opportunity to...
demonstrate that their achievements are appropriate for their stage in the program.

**Diagnostic assessment**

Diagnostic assessment can be used to “establish a baseline for standards within a course, allow students to determine their preparedness for their current learning activities …, [and] identify gaps in specific knowledge” and is “used to provide students with appropriate resources for improving their current level of acquired knowledge … to identify deficiencies in current understandings” (Crisp, 2012). It is used to assist both teacher and student to plan for learning. Sometimes, pre-requisites are used as proxies for diagnostic assessment. If the cohort in a course is homogenous, the teacher can generally make fairly reliable assumptions about the knowledge that the group brings to the course – but it’s always worth checking. This checking process doesn’t have to involve formal testing; the teacher could just ask the student. For example, the KWL technique is an excellent way for the teacher to evaluate students’ existing knowledge, while at the same time giving students opportunity to get to know each other better.

**KWL technique**

Briefly, the teacher gets each student to complete the first two columns in the KWL table, columns labelled K (prior Knowledge) and W (that which the students Wish to learn) in the first session for the course, and L (a reflection on actual Learning) in the final session. This can be combined with group discussions, where students share the information they have documented, both in the first session and as a wrap-up session at the end of the course.

**Formative assessment**

Earlier in this document, we reflected on the idea of the Teaching-Learning Flow. Teachers will be assessing students throughout the TEACH and LEARN phases of the Flow, and using the information garnered to modify the learning activities as they are implemented. This is formative assessment. It guides the teacher’s day-to-day teaching and allows her to design learning activities that will address deficiencies in student learning in the course.

The difference between formative and summative assessment hinges on purpose, and depends on two characteristics, feedback and marks, as can be seen in Table 2.

**Table 3: A comparison of formative and summative assessment**

<table>
<thead>
<tr>
<th></th>
<th>Feedback: advice to students about what they need to do to improve their learning</th>
<th>Marks that count towards the final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formative assessment: helps students learn</strong></td>
<td>Always provided; feedback may include a mark, but not one that counts toward the final grade</td>
<td>Never awarded</td>
</tr>
<tr>
<td><strong>Summative assessment: helps teachers judge achievement</strong></td>
<td>Sometimes provided</td>
<td>Always awarded</td>
</tr>
</tbody>
</table>

The primary purpose of formative assessment is to provide the student with feedback that will guide his learning; the primary purpose of summative assessment is to provide the teacher with the evidence she needs to judge whether or not students have achieved the learning outcomes. Formative assessment
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informs learning, teaching and curriculum design; summative assessment informs professional academic judgement and grade allocation.

Because Australian universities across the board score badly in student satisfaction surveys on The Feedback Question (usually something along these lines: “Did you get enough useful feedback?”), it is very important to tell students when you are about to give them feedback, and to name the process.

Remember, there are two types of feedback provided by university teachers. The first is feedback designed to assist students to better complete future tasks (formative feedback); the second is feedback on summative assessment, which explains and justifies the mark allocated to the work.

So – and this is one of the dilemmas faced by the time-starved curriculum designer and teacher – a well-designed learning experience (a course) incorporates both formative and summative assessment. For pragmatic reasons, many teachers (university lecturers in particular), design assessment strategies in which individual assignments are used for both summative and formative purposes. In practice, this means that students are provided with formative feedback on assignments that are being used to assist the teacher to make summative judgements about academic achievement for grading purposes. This can be tricky to pull off, and may be less than helpful or even confusing for the student. Sadler, who has long advocated teaching strategies that assist students to develop the skills to evaluate their own work against standards set by the teacher, especially during the “process of production”, has suggested that it may be impossible to use a single piece of assessment for both formative and summative purposes (Sadler, 1989). Price et al (2011) also warn against mixing the two forms of assessment in one activity, suggesting that feedback on summative work is usually written as a justification of the mark (rather than as information that students can use to improve future learning). There is no doubt, however, that using each assignment for dual purposes does reduce the amount of time spent on marking.

**An example of an assessment strategy**

Taylor (2008) outlines a single assessment strategy designed to address both formative and summative purposes. Her phased approach, based on a typical three-assignment pattern, divides the semester into three phases of teacher-marked assessment, supported by self-reviewed and self-assessed formative learning activities.

*Figure 7: Phases of assessment (adapted from Taylor, 2008)*

In the first phase, that of Transition (in Taylor’s model, this refers particularly to the transition first year university students are making from school to higher education), she recommends a high level of formative feedback on the summative assignment. Her recommendation is that this phase of the semester is characterised by activities that make a low contribution to the final grade. She recommends reflective learning activities. For first year students in particular, she recommends that the teacher spend time
assisting students to complete personal study plans and negotiating learning contracts. In this phase, with first year students, teachers have an opportunity to assist students to begin to understand the culture of higher education, and their new university in particular. Taylor recommends self-reviewed and self-assessed formative learning activities to back up the summative assessment strategy, and she indicates that these should begin in about the third week of the semester.

In the second phase of Taylor’s model, that of Development, she recommends summative assessment strategies that make a low to middling contribution to the final grade, while still providing considerable formative feedback. The types of activities that she has in mind are draft essays, reading logs, notes on literature reviews, or materials prepared as part of a portfolio – artefacts that could be described as preparation for or sub-sections of the final assignment. Marking time for these middle phase activities will be relatively high, because the teacher will be providing formative feedback that will assist students to complete the final stages of these assignments more successfully.

The final phase of Taylor's model, that of Achievement, is characterised by summative assignments attracting marks with a high weighting. That is, they will have a significant influence on the final grade. Because these assignments will be completed or submitted late in the semester, Taylor recommends that the teacher spend less time commenting on them. By this stage of the semester, the teacher will be more focussed on judging how well students have achieved the learning outcomes than on identifying ways to assist students to learn better.

If Taylor’s model were to be adopted, and explained to students early in the semester, some of the problems associated with the provision of formative feedback on summative assessment items may be alleviated. It should also be noted that Taylor’s model doesn’t explicitly provide for the kinds of activities that assist students to develop the skills to evaluate their own work against standards set by the teacher.

**Assessment strategies and instruments**

The Internet is a wonderful thing, and will provide you with more information that can possibly be included here about different kinds of assessment strategies and instruments, but just to demonstrate that there is more to assessment than essays, reports, and multiple-choice testing, here are some ideas.

1. Blogs
2. Case study analyses
3. Cloze passages
4. Concept maps
5. Critiques
6. Debates
7. Demonstrations
8. Diagrams
9. Digital presentations
10. Discussions
11. Dramatic performances
13. Glossaries
14. Graphic organizers
15. Interviews
16. KWL tables (K = know; W = wish to know, L = have learnt)
17. Laboratory reports
18. Learning journals
19. Matching exercises
20. Mind maps
21. Mini-conferences
22. Musical composition
23. Peer evaluations
24. Portfolios
25. Posters
26. Presentations
27. Problem-solving activities
28. Projects
29. Reports
30. Research papers
31. Role plays
In some disciplines, the artefact that is assessed will be a physical object: a painting, a sculpture, a film, a machine, or a widget. When selecting the instrument of assessment, think first about the best way for students to demonstrate their newly acquired skills and expertise. Explore the Web for examples of the ways in which teachers around the world make use of these instruments for different dimensions of assessment.

Feedback

A university education is more than the mastery of competencies. A university education is an induction into the discipline. This affects every aspect of learning, and has particular impact on the way students are guided in their learning.

The results of student satisfaction surveys tell us that effective feedback is important to students and that they are frequently dissatisfied with the level of feedback they get (Ferguson, 2011; Price et al, 2011; Carey et al, 2010; Price et al, 2010; Johnson, Cazaly, & Olekalns, 2008; Holmes & Papageorgiou, 2009; Brown, 2007; Scott, 2006); and yet teachers often feel that students don’t pay appropriate attention to the feedback that is provided (Budge & Gopal, 2009; Poulos & Mahoney, 2008; Bermingham & Hodgson, 2006). It is likely that students are complaining not so much about the level or timeliness of the feedback they are receiving, but more about the lack of feedback that they can understand and use to improve their work – and their marks.

Feedback comes in two forms: an explanation of the mark given, and information that will assist students to complete future tasks more successfully. Adcroft (2011) demonstrates that at least part of the problem lies in communication, and presents evidence that staff and students perceive the same feedback event quite differently. Crisp (2012) has suggested that there is a need to review the names we give the activities associated with assessment for learning and assessment of learning; that is, feedback designed to assist students to do better on future tasks, and feedback designed to explain a grade or mark. It is very likely that students are focussed on how they might be more successful at the course level, and their teachers have a longer-term view and are providing them with feedback / “feedforward” designed to assist them to be more successful in the discipline.

Many academics have reported on the use of marking rubrics in assisting students to produce work of an ever-increasing quality (see Reddy & Andrade, 2010, for a review of rubric use in higher education), and some have gone beyond rubrics, outlining why the use of marking rubrics does not, on its own, provide students with all the information they need to understand why and how their work falls short, or outlining strategies that teach students how to be better judges of their own work (Sadler, 1983; forthcoming; Boud & Falchikov, 2006; Yorke, 2005). O’Donovan, Price & Rust, for example, have written about this issue extensively (Price, Handley, Millar, & O’Donovan, 2010; O’Donovan, Price & Rust, 2008; Rust, 2007; Price, O’Donovan & Rust, 2007; Price, 2005; Rust, O’Donovan & Price, 2005; Rust, Price & O’Donovan, 2003), and have developed a strategy that assists students to understand the teacher-defined academic achievement standards that underpin a marking rubric (their 123 Improve your students’ performance in 90 minutes leaflet, available from the Oxford Brookes ASKe website outlines the strategy) (O’Donovan, Price & Rust, 2004).

So what does this mean for busy university teachers?

Principles for the provision of feedback

1. When you provide feedback, tell your students that you are providing feedback (and that they should take note).
2. “Feedforward”: Tell them when you are giving them information that will help them to complete future tasks more successfully. Where possible, relate the feedback to a particular future task and be explicit. Make sure that they get the feedback in time to use it effectively. Use real examples, perhaps from the work of previous students (with their permission, of course). If the “feedforward” is relevant to tasks students may be assigned in future courses in the same discipline, tell them so.

3. Explanatory feedback: Provide explanations of marks at the same time as returning marked assignments. If possible, link explanatory feedback to previously-provided “feedforward”. Use real examples so that students know how their work differs from the very best work on the same subject, from people at the same stage in their studies.

Marking

This brings us to marking, and another of the dilemmas that face many teachers: learning outcomes describe what students will be able to do once they have completed the course. Curriculum documents commonly use a head phrase like “Upon successful completion of the requirements for this course, students will have the knowledge and skills to …”, but final year or end-of-semester 100% exams or assignments are quite uncommon these days, for very good reasons. Students are keen to know how they are travelling so that they can adjust their approach if it isn’t working. Teachers monitor student submissions throughout the semester to assist them in tracking student success. Nevertheless, both students and teacher need to remember that marks allocated for assignments completed early on in the semester can signal only partial achievement of course learning outcomes.

Markers need not only to recognise this, but also to make it clear to students – via the marking criteria or rubric – how their work will be judged. In the world of criterion-referencing, if all students submit summative assignments that demonstrate that they have achieved the learning outcomes to the highest standard outlined by the lecturer in the marking rubric, then every single student in the cohort will receive the highest grade. The use of rubrics in competency-based learning is, given this, commonplace. If, however, students live in a norm-referenced world where they will be ranked based on their marked work before grades are allocated, the slightest variation in the marks allocated will have a significant impact on student grades.

Text-matching software

I am not going to spend much time on text-matching applications such as Turnitin, except to note that these systems are not designed, as many think, to detect plagiarism. Rather, they are text-matching applications and will only identify instances where students’ assignments contain phrases and paragraphs that can also be found in other assignments held in the Turnitin database. There are three problems with this:

1. These days, the really serious plagiarist is commissioning original work and submitting it under his or her own name. (For more information on these practices, see two of my blog postings: Turnitin and cheats and Thwarting the Shadow Scholar.)

2. An honest student who quotes extensively, but also references his or her sources correctly, may be misled into thinking that he or she is not observing correct protocols.

3. A cheating student who submits an assignment with plagiarized work not in the Turnitin database will not be identified.

While it might be better to get your academic skills and learning people to come in and run a session on academic honesty, and to back it up by running any suspect phrases through an Internet search engine, there is no doubt that text-matching applications do assist busy academics with some aspects of the management of dishonest academic behavior. It will help you to catch some of the cheats.

6 Remember that in Australia, students retain intellectual property rights for all their assignments and examinations.
Marking rubrics

If you do provide students with the criteria against which you will be measuring their work, there is one other aspect that needs to be mentioned. How do you intend to deal with the non-content specific aspects of the assignment? For example, some teachers will include in the assessment criteria for an essay not only the content they expect to see, but also writing skills – they evaluate the structure of the essay, spelling, grammar, syntax, the presentation of the assignment, and so on.

These generic skills – writing, speaking, and presentation – are important skills. Is it your role to assess them in your course, and if so, should you also be teaching them? If they are not taught or assessed in your course, when are they taught and assessed? How will you rank two assignments, both of which show evidence of understanding of the content and ability to apply the knowledge, if one is particularly well-written and presented and the other is not? How do you rate the work of two students which is equivalent in quality, except that one clearly is very familiar with the language of the discipline and uses it well, and the other does not? Consider an example from biology, where one student uses the term “living” and the other the term “alive”. Biologists speak of “living” organisms, rarely of organisms that are “alive”. Is one of these students a better biologist than the other? If a person working in your discipline didn’t use the specialist language of the discipline, would that affect your assessment of his or her ability? When you are marking the work of your students, do you use only the criteria listed in your marking rubric, or are there other, unarticulated, criteria that slip in when you are making a judgement?

Moderation

Moderation is an umbrella term that applies to a range of collaborative teacher practices that assist teachers to calibrate academic achievement standards across multiple markers. The purpose of these moderation activities is to validate assessment tasks and plans, and to ensure reliability and consistency of judgements within and across courses and programs.

It is unlikely that you would encounter all the activities over the page in a single institution, mainly because there is a cost involved in moderation activities. Nevertheless, an institution that has no formal moderation practices in place runs the risk of uneven marking, a high rate of student appeals, and little evolution in assessment practices. It’s probably useful to have at least one moderation activity for each of the four stages (design, implementation, marking, and grading) listed.

Review

So, what does all this tell us? It means that an assessment strategy will, at the very least, include summative assessment and formative feedback. It should probably also include formative assessment so that students get an opportunity to practice before they are tested on new knowledge. It may include assessment that relates to the other dimensions identified by Crisp (2012): diagnostic and integrative. The former assists teachers to plan appropriate teaching activities and students to plan their own learning; the latter assists students to negotiate future learning in a more informed way. It ought to align with teaching and learning activities. The artefacts that students are asked to produce must provide the teacher with the evidence he or she needs to make a judgment about how well students have achieved the learning outcomes. Feedback – provided early and often – is important to students, because they do read it, and they do use it to improve their learning both current and future, even if it doesn’t seem that way to teachers. Students benefit greatly from any activity – formative or summative – that helps them to understand what they have to learn to achieve the academic standards against which their teacher is measuring their work. The better they are at understanding how to improve their own current learning, the better they will be in planning their own future learning. Marking rubrics will assist students to understand the standards against
which they are being measured, but they need more than the rubric. Academic achievement standards need to be calibrated to ensure consistency and fairness in marking.
What counts as moderation?

Which of the following moderation activities are commonplace in your institution? Are they formalized or mandatory? Are there any that you would find useful? Which ones are unnecessary in your workplace?

1. During the design of an assessment strategy, is your assessment plan (descriptions of assessment tasks, marking criteria, timing of submission deadlines for assignments, format and timing of examinations):
   a. Reviewed by your peers?
   b. Ratified or approved by a supervisor or peer group?
   c. Discussed in detail with your teaching colleagues and tutors to ensure a consensus understanding, e.g. of wording, purpose, explanations to students?
   d. Accredited by an external agency?

2. During implementation of the strategy, particularly just before and during the process of marking student work, do you:
   a. Calibrate your marking standards with your colleagues, e.g. engage in group marking practice of previous student responses to similar tasks from previous study sessions, or group discussions of provisional marks allocated to samples of student work from the current cohort to ensure that you are applying similar standards?
   b. Double mark?
   c. Meet to compare and review:
      i. the distribution of marks?
      ii. special consideration cases, e.g. borderline or problematic examples?
   d. Seek validation of marking, e.g. by having samples of student work re-marked by external assessors?

3. After all the work has been marked, do you:
   a. Meet to discuss rankings and adjust grade distributions?

4. After students have been allocated their final grades, do you:
   a. Discuss student appeals as a group or with your supervisor?
   b. Meet with your colleagues to review assessment strategies, e.g. the coherence of the assessment experience from the student perspective, consistency of standards, consistency of wording of criteria, or the processes of moderation?
   c. Call on external examiners to monitor standards, assessment decisions, the credibility of assessment methods and instruments, internal moderation processes and to provide advice and guidance on prospects for improvement?

Do you do anything else that would count as moderation? Describe these practices.
Designing an assessment strategy

Before you finalize the assessment strategy for your course:

1. Review the learning outcomes for the program.
2. Compare them to the generic skills promulgated by your institution (if there is such a list).
3. Review the learning outcomes for the course. What would demonstrate to you that students had achieved these learning outcomes?
4. Make any adjustments necessary to ensure alignment of statements of graduate skills and capabilities (generic skills), program learning outcomes, course learning outcomes, and assessment. (This step is one you will repeat several times as you work your way through the various steps in designing curriculum.)
5. Decide what, for you, is the largest acceptable gap between the knowledge that students in your course have mastered and a perfect performance.
6. Decide how and when you will give students opportunities to practice before they are tested.
7. Decide how and when you will give students formative feedback on these practice activities.
8. Choose your summative assessment activities. Do you plan to set examinations? What kinds of examinations will you set (open-book, closed book, invigilated, take-home)?
9. Schedule the summative assessment activities for the course.
10. Adjust your summative assessment strategy to ensure alignment in your curriculum.
11. List the criteria you will use to assess the work of the students.
12. Decide how students will come to understand the criteria against which their work will be judged. Will the marking rubric be provided to them before an assignment is submitted? How much assistance will they get to interpret the criteria?
13. Think about grade distribution. If all students successfully achieve all learning outcomes, how grades be distributed and students ranked?
14. Decide how group work will be marked.
15. Review the formative aspects of your strategy: Have students have sufficient time to practice the skills and expertise you are testing? Have they had sufficient feedback on their practice runs to be confident of achieving the outcomes you intend?
16. Decide how you will address issues of timing, feedback, marking turnaround times, marks, and grades.
17. Choose your moderation practices. How will you ensure the validity of your assessment strategy? How will you ensure that judgements made of the work of your students are reliable and consistent, and that marks and grades have been allocated fairly?

Once you have made these decisions, document the strategy in your Course Outline. Over the page, you will find suggestions for ways to document the summative aspects of the strategy.
Documenting your assessment strategy

In documenting your assessment strategy, it is best to provide an overview, followed by detailed descriptions of each piece of assessment. Using the following templates, document an assessment strategy suitable for a course with which you are familiar.

<table>
<thead>
<tr>
<th>Assessment item</th>
<th>Description of assignment</th>
<th>Specific requirements</th>
<th>Due date</th>
<th>Allocation of marks and % weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assignment 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Then provide the detail for each assignment. Use the following headings / sections:

1. Type of product / artefact (for example, you may be asking students to produce any one of the various products outlined earlier in this text, e.g. essay, sculpture, simulation …)
2. Due date
3. Value / weighting (%)
4. Marks
5. Suggested length (for example, you may need to provide information here about constraints or restrictions on excessively long or short submissions)
6. Instructions (for example, you may have particular instructions about the use of certain equipment or software, you may need to provide guidelines about the way you are running the exam, or you may wish to provide a framework or some other guideline)
7. Purpose (for example, if students are writing a report, it may assist them to have a reason for generating the report)
8. Audience (for example, if you are asking students to demonstrate that they can write a report for a particular audience, you will provide details of that imagined audience)
9. Marking criteria
10. Submission / Presentation details (for example, here you might provide information about penalties for late submission or requirements about typewritten submissions)

What other information will assist students to complete the summative assessment items successfully?
Teaching and learning activities

Earlier in this document, we looked at the flow of interactions or transactions that occur during a course – the teaching aspects of curriculum. These interactions and transactions encompass all the contact between student and teacher, and some student-student contact. It is during these interactions and transactions that the lecturers and tutors in a course guide students towards successful completion of summative assessment. However, these transactions and interactions provide much more than advice on how to complete the assessment. In the hands of inspired and inspiring university teachers, they induce profound change in the student. It is through these interactions and transactions that embryonic discipline-novices become fully formed experts, able to view the world through the lens of the discipline, to understand the problems, questions, and solutions of the discipline, and to use the tools and techniques of the discipline in highly effective ways.

It’s not enough to set course learning outcomes, to design an assessment strategy to test how well students have achieved these outcomes, and to deliver content. In the following Figure, we look at some of the types of teaching events that might occur in a university course, and explore consequent stages of student learning.

Figure 8: One possible structure and sequence of transactions and interactions between a university teacher and the student

<table>
<thead>
<tr>
<th>TEACHER activities</th>
<th>STUDENT activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. COURSE LEARNING OUTCOMES</td>
<td>define the goals and purpose of the course</td>
</tr>
<tr>
<td>2. TEACH</td>
<td>tell, show, model, lecture, demonstrate</td>
</tr>
<tr>
<td>3. COMPREHEND</td>
<td>acquire (declarative knowledge: facts and principles)</td>
</tr>
<tr>
<td>4. TEACH</td>
<td>facilitate learning activities</td>
</tr>
<tr>
<td>5. PRACTICE</td>
<td>develop expertise (functioning knowledge: problem-solving and critical analysis)</td>
</tr>
<tr>
<td>6. TEACH</td>
<td>provide formative feedback (guide students in the application of functioning knowledge)</td>
</tr>
<tr>
<td>7. DEMONSTRATE</td>
<td>complete summative assessment to show achievement of learning outcomes</td>
</tr>
<tr>
<td>8. ASSESSMENT</td>
<td>judge student achievement</td>
</tr>
</tbody>
</table>

Sometimes these interactions occur face-to-face, and sometimes they occur in an online learning environment. Sometimes they occur over the phone.

In the first set of interactions (2 and 3), the lecturer provides students with the declarative knowledge for the course – the facts and principles. This information might be presented, for example, in a lecture, or via a set of readings, or in a multimedia package. So a student’s first responsibility is to learn the foundation information for a course. This knowledge acquisition may be tested, perhaps in an in-class quiz, or some
questions that the lecturer uses to elicit and highlight key concepts, or even a small examination where students are asked to recall and explain the facts and principles.

There are a variety of ways to test this type of knowledge. For example, Eric Mazur has developed a very effective technique he calls peer instruction.

**Mazur’s Peer Instruction**

A Harvard lecturer in physics (the technique works for many other disciplines as well), Eric Mazur, discovered that his students were not as knowledgeable about physics as he had hoped, even when they scored well on in-class tests. He developed a classroom technique that uses “clickers” – handheld classroom response devices – to ensure deep, persistent learning. This technique requires students to first commit to an answer, and then to convince their fellow students that their answer is correct. This simple technique has improved results for Mazur’s students, something he proves with quantitative data collected over 20 years. The technique is easily adapted for most disciplines. The process is outlined in the flow-chart.

You will need some equipment to make this technique work. If you don’t have access to classroom clickers, prepare pieces of coloured card. Then, when you ask your question, students respond either by clicking the handheld device (which will throw up a neat histogram on the projected screen), or by holding up the relevant coloured card (e.g. red for A, green for B, purple for C or red for YES, blue for NO), which will allow you to scan the room and make a decision about which step you will take next. (Mazur, 1997)

**Beadle’s Jigsaw**

Another innovative way to ensure that students fully understand the foundation facts and principles for a course is to use Phil Beadle’s jigsaw technique.

Group the students. Give each group a set of readings on one aspect of the topic (a separate set of readings for each group), a couple of days in advance. On the day of the discussion, sit the students in their groups (say five to a group). These are their Home Groups. First, they discuss the readings and tease out the issues for their particular aspect of the topic. They become experts on this aspect of the topic.

Next, you want to re-group the students into their Expert Groups. Do this by selecting one student from each Home Group for each Expert Group. You could do this by numbering the students. Each Home Group has students numbered 1, 2, 3, 4, and 5. Each Expert Group is made up of five students with the same number. In the second round of discussions, each member of the group contributes the knowledge they garnered from the readings and discussions they had in their Home Group. This technique builds on the idea that you learn something rather well when you have to explain it to someone else. (Beadle, 2010)

For more information:
- The Mazur Group website
- Confessions of a converted lecturer video
- Mazur’s Peer Instruction book
It’s not enough, however, for students to learn the facts and principles. Apart from anything else, most people don’t fully comprehend new information until they apply it. So, in the second set of interactions (4 and 5), the teacher will design a series of learning activities that require students to apply this knowledge. These are unlikely to be summative assessment activities; rather, they provide opportunities for students to practice applying their new knowledge in the development of new expertise. In completing these activities, they get some formative feedback so that they know whether or not they are on the right track.

Strategies for providing useful formative feedback abound. In these activities, you are developing students’ abilities to solve the problems of the discipline. Until your student begins to undertake original research, these are problems which have already been solved by members of the discipline, but which are new to students. Because they have already been solved, you are able to guide your students through the discovery of how they were solved; your students are able to re-trace the steps of those who have gone before them. These activities might be in class activities, perhaps worked through in groups. They could also be online collaborative activities, or tasks you set for students to work on in between tutorials. In these types of activities, you will give students practice problems to solve. Make sure that you take them through the problem, explaining the solution or highlighting where they have completed the task. At this stage, you will be focussed on providing formative feedback that will assist students to complete the summative tasks much more successfully.

As students complete these activities, you will be providing formative feedback by:

• showing them examples of high quality work produced by previous students or their own
• structuring feedback so that it moves learning forward
• incorporating techniques that ensure that students have taken ownership of their own learning, and
• encouraging students to collaborate in each other’s learning
• giving students opportunities to learn how you judge quality work

Here are some examples of the kinds of activities that you might incorporate in your curriculum.

Sadler’s technique for teaching learners to notice

In the following strategy, employed by Royce Sadler, students are learning how to judge quality and how their work measures up against the academic achievement standards of the lecture.

He developed the technique to develop students’ ability to:

• make holistic, realistic, honest judgments that are focused exclusively on the quality of academic work,
• notice aspects of the work that are germane to the judgment and pass over aspects that are routine, expected, and unworthy of special mention, and
• construct sound rationales for their judgments.

The purpose of this strategy is to create students as “budding assessors” not as constructors of feedback for peers or consumers of feedback from peers – although he reports that students did find the comments on their work from their peers to be very useful.

Here is how he does it.

1. Each student is asked to create a short paper (300 words) in response to a specified academic task. The task is designed so that high quality responses require “substantial cognitive activity and engagement” to address a “novel and previously unseen issue”. Students need to distil and integrate material from different sources; it would not be easy to create the response texts by reproducing, adapting or compiling content from other sources. Sadler also completes the task, creating the best possible paper he can. Clearly, some considerable thought needs to go into the construction of the task.
2. Each student brings three copies of their paper to a class gathering. One set of the papers is shuffled and distributed, one to each student. Sadler’s paper is amongst those that are distributed.
3. Students read and evaluate the paper they have been allocated. In this activity, they are expected to make a judgment about overall quality. (Sadler’s strategy here is to get students to recognize
Students represent their judgment of overall quality on a scale. Sadler asks them to place an X in a line segment (120mm long) that has no scale points on it. The left hand side of the line represents Low Quality, and the right hand side represents High Quality. In this way, students are required to commit to their judgment, but are not asked to allocate standard marks or grades to the papers.

4. Students justify their appraisal by writing 70 words, in which they avoid praise or criticism and stick to the quality and properties of the work itself. They are expected to invoke whatever criteria are necessary to explain the judgment. They are not provided with criteria.

5. Finally, each student writes some advice to the author of the paper, outlining ways in which the work could be improved or a future similar work made better.

6. In later iterations of this task, once students are experienced with the first three stages of the process, Sadler asks them to comment on how well the paper addressed the issue.

7. If there is time, the exercise is repeated more than once (hence the need for students to bring three copies of their papers to class).

Sadler reports that students not only get better at the task, they get faster. (in Merry et al, forthcoming)

The (traffic) light of understanding

This is a simple technique that gets students to take ownership of their own learning and collaborate in the learning of their peers. Provide each student with a set of cards (red, green and yellow). At the appropriate moment, ask them to indicate how well they have understood the concept you are teaching. Get the green card holders (full understanding) to explain the concept to those holding up yellow or red cards (partial or no understanding).

Two stars and a wish

Get students to give each other feedback on a piece of work in progress: two stars and a wish. Each star represents something sound and solid in the piece of work, and the wish represents something that merits further attention.

Close the gap

Teach students to monitor their own progress on tasks you have set. Give them regular opportunities to discuss the following questions with you and their fellow students:

- Where am I going?
- Where am I now?
- How can I close the gap?

Each of these tasks is designed to assist students to clarify for themselves how well their work compares to that of others in the discipline, and to learn from the formative tasks you have set for them. The more formative feedback of this kind you provide for students, the better they will perform.

Finally, once students know what it is that they are expected to have learnt, they will complete summative assessment activities (6 and 7) to demonstrate how well they have learnt the new material and how well they have achieved the learning outcomes for the course. It is these assignments that the teacher will judge, which will be marked, and which will give the student their grade for the course.

These final assessment tasks should be similar in style and form to the learning tasks they have already completed, although the outcome will be different. That is, they should have already practiced solving similar problems, but the problems they encounter in their summative assessment tasks will be new problems to which they can apply familiar tools and techniques.

It’s more complex than this, of course. The first summative assessment item in a course generally occurs quite early on in the delivery schedule, so actually there are multiple iterations of this process overlapping each other, a bit like a musical round.
Technology in education

In education, as in all things, technology is an enabler, not an end in itself. It ought to be used only to achieve real goals – pedagogical and disciplinary. The catch, though, is that unless you are familiar with the functionality of the technology, the possibilities are not transparent and if you spend time investigating the functionality of the technology, it may become the lens through which you view your teaching practice. Sometimes it’s best just to put that to one side, and to work out which bits of technology are going to help you to do your job better or more efficiently or more easily, based on the information you have to hand. To that end, here is some information.

Every teacher in Australia relies on technology: whiteboards, document readers, microphones, library databases … the list is endless. Usually, though, when people talk about technology in education, they mean the web-based tools. These tools assist you to design and implement teaching and learning activities. While it is true that occasionally a new web-based tool might prompt you to think of an innovative learning activity, generally things ought to work the other way round; that is, you design a learning activity and then seek out the technology that will enable you to run the activity.

The most commonly used web-based technologies in the delivery of higher education in Australia are:

- Learning Management Systems (LMS), e.g. WebCT, Moodle, Sakai, Blackboard or Janison
- lecture capture systems, e.g. the ANU's Digital Lecture Delivery (DLD) or Echo 360
- desktop videoconferencing systems, e.g. Adobe Connect, Blackboard Collaborate, or Wimba Live Classroom
- portfolio tools, e.g. Mahara
- content authoring tools, e.g. Camtasia, Captiva, Audacity, GarageBand, and a raft of others
- social networking tools, e.g. blogging and wiki tools, YouTube, bookmarking tools and multiple purpose applications like Ning and ELGG
- repository / sharing sites like Instagram and Flickr

Learning Management Systems

The first true English-language Learning Management System to appear on the scene was WebCT, invented at the University of British Colombia in the mid to late 1990s by Murray Goldberg and his colleagues and graduate students. It proved to be such a useful tool in the management of online learning environments that it spread very rapidly throughout the English-speaking world and beyond. In the first couple of years, Goldberg gave away copies of the beta version of the application. With the advent of the LMS, many more institutions opened up their delivery modes and began to deliver programs at a distance (time or space or both). Prior to the invention of WebCT, university teachers were using a large number of web-based tools which had some but not all of the functionality of an LMS. Goldberg’s real breakthrough was twofold: he found a way to combine (almost) the full range of tools teachers were already using by combining one or more applications, and he introduced the idea of feeding data from institutional student records systems into the LMS automatically, so that only enrolled students had access to the password-protected online learning environment or the Learning Management System.

In 2012, we have two widely used open-source LMSs – Moodle, invented by Martin Dougiamas in Perth, and Sakai, created by a consortium of north American universities. The vendor-supported LMS market is dominated by Blackboard, which has in the last few
years bought two of its three closest competitors – WebCT and Angel. The third serious player in this space, which has the second largest market share of the English-speaking LMS market, is a Canadian product called Desire2Learn. After Desire2Learn rejected a takeover offer from Blackboard in about 2005, Blackboard sued them for breach of patent. The story of the dispute is a long and fascinating one, documented in detail by bloggers like Michael Feldstein (e-Literate). The dispute was finally settled with a confidential agreement after years of litigation in the US court system. Not many of the details of the arrangement are known, but we do know that a couple of years after Blackboard was forced to return a “royalty” payment of $3 million to Desire2Learn, with interest, the company abandoned its claim to have invented the LMS.

The higher education LMS then, is dominated by these players. However, type “learning management system” into the search window for your browser, and you’ll come across any number of new products, some more obscure than others. Some of these other products are corporate LMSs, designed for use with training programs; others, like Janison, for example, emerged from the Vocational Education and Training (VET) sector, and are perhaps less suitable for higher education. The corporate LMSs differ from those designed for the higher education sector in a couple of obvious ways. One of these is that they generally have tools that provide for a more controlled pathway through the learning experiences, and they often have an editing module that provides for a team of curriculum designers working concurrently on the same learning sequence.

Designing a course to be delivered online or in a blended mode requires a slightly different approach to course design – and you do need to know what the technology can do before you decide how to use it. So, if you are planning to offer any web-based resources or experiences for your students, the first thing to do is attend Wattle training sessions and spend some time playing in one or more online learning environments. Sign up for a MOOC\(^9\), or listen to Daphne Koller talking about Coursera in her TED Talk\(^11\), or take a short course online, or ask a colleague if he or she will add you to his or her Wattle course so you can poke around.

Keep in mind that we all use many tools that allow us to time-shift, and that this is one of the real strengths of web-based technologies. For example, we no longer always attend live theatre performances to be entertained by actors, because we have access to film; we no longer have to arrange to be at home in front of the television when our favourite soap opera is being broadcast, because we have PVRs; and we no longer have to attend the ACTU Congress to hear Bob Hawke belt out Solidarity Forever because we have the YouTube version\(^12\). It also means that for the first time for hundreds of years, university teachers are doing less lecturing, and more student-centred, learning activity-based teaching. They are, across the world, providing students with the declarative knowledge of the course (facts, principles, theories, formulae) before introducing learning activities in which they learn to use these facts, principles theories, and formulae to analyze, synthesize, solve, judge and evaluate. The declarative knowledge, traditionally provided in lectures, is now also being provided in other ways, e.g. podcasts, guided readings, video clips and URLs to name a few. Depending on the structure of a course, this either allows students more flexibility in their ability to time-shift, or it frees up precious face-to-face time for other activities.

So what functionality does an LMS provide?

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9 http://en.wikipedia.org/wiki/Massive_open_online_course

10 In late 2012, MOOCs attracted the interest of a number of Vice Chancellors, many of whom spoke publicly about them without fully understanding the concept. At the time, I wrote about them in my blog. The entry can be found here: http://educational-reflections.blogspot.com.au/2012/10/moocs-next-big-thing-or-what-about.html


12 http://www.youtube.com/watch?v=MuMNJ-MyTWk
Tools

Every LMS in the world has a similar range of tools. These groups of tools provide for:

- **Dissemination of information**: These are the tools that allow you to send messages to students (e.g. news and notices), or direct them to information available in a digital form somewhere on the web (e.g. material available freely on the web or library databases to which the ANU library subscribes or information about processes and policies on the ANU website), or give them advance access to materials you have created (e.g. your lecture handouts).

- **Collaboration and conversations**: These are the tools that allow you to set up groups to work on projects, or initiate debates, or provide opportunities for students to comment or reflect on case studies, provocative statements, probing questions and the like.

- **Management of the participant group and the online learning environment**: These are the tools that allow you to track which pages have been viewed by which students, how often students have posted, when students have submitted assignments, patterns of access over time, and the like.

- **Assessment**: The assessment tools generally include an assignment dropbox with an automated receipt function, an online markbook with selective, controlled release mechanisms (so that you can release marks to students as you wish), and various survey and quiz tools.

- **Activity sequencing tools**: These tools are starting to come into their own. They are tools that assist you to create a learning design or a learning sequence, so that you can control student progress through a number of different learning activities.

There are also many how-to videos on You Tube, which will walk you through various Moodle tools.

Quite apart from the various in-house applications, many university teachers have been making significant use of social media. In a recent book, Poore explores many aspects of social media, including the extensive range of tools – RSS, hyperlinks, tags, tag clouds, widgets, blogs, wikis, social networks, podcasting, visual media, messaging, chat, Skype, Twitter, bookmarking, clippings, mindmapping, polls, games, and mobile learning (Poore, 2013). Not only does she explain what these tools are, and how to use them, she discusses them in the context of education. This area of education is fast-moving and fluid. To cope with this, Poore provides a companion website: [http://usingsocialmediaintheclassroom.wikispaces.com/](http://usingsocialmediaintheclassroom.wikispaces.com/). On its own, the website provides an excellent overview of the value of social media for teaching and learning.

In summary

My final words of advice are these:

1. Implement in your course those technologies that will assist you to teach your students.
2. Don’t reject any technology until you know what it can do, and don’t assume you know what it can do until you have used it.

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ANU’s Wattle

In addition to LMS tools, the ANU’s Wattle has a lecture recording tool (DLD) and a desktop videoconferencing tool. The lecture recording tool works only in certain, equipped teaching spaces and is accessed via the podium. It is simple to use, and lectures captured this way will usually automatically appear in the DLD “block” on your Wattle site within hours. In the older equipped teaching spaces, DLD collects an audio recording of the lecture. In some of the more recently-equipped spaces, it is possible to capture a video of the lecture, or an audio recording plus anything that is projected onto the screen of the theatre, i.e. images like PowerPoint slides or taken from the document camera. The video-conferencing tool, Adobe Connect, is a bit like an online meeting tool. You shouldn’t try to use it for teaching purposes until you have practiced, but once you have mastered the technology, you’ll be able to teach up to about 15 students who are separated by geography at the same time.
3. Don’t be distracted or beguiled by bright, shiny things; they are pretty, but they may not help you or your students.
4. Be clear about how the technology adds value: are you providing opportunities for time-shifting, or freeing up precious face-to-face time for something other than lectures, or something else useful?
5. Don’t be afraid of the technology: dive in, the water’s fine.
Evaluation reviews can be designed for a variety of purposes, each with a particular focus, e.g. currency of content, clarity of articulated course or program goals, achievement of outcomes, alignment of learning goals with the assessment strategy, impact of courses and programs, quality of teaching, modes of delivery and the way these influence marketing strategy, implementation of curriculum innovation, curriculum design, need for the course or program, student satisfaction, or even cost and efficiency. More often than not, in Australian universities, there are three key areas of regular evaluation of courses / programs and teaching, any one of which may be implemented for one or more of these purposes, with the addition more recently of peer evaluation of teaching quality:

- Reviews of content and curriculum design, generally conducted as internal reviews, and occasionally by peer reviewers external to the institution
- Moderation activities by those teaching in the program, with a focus on student assessment and curriculum alignment
- Student satisfaction surveys with a focus on courses and programs (conducted both during their studies and after graduation), and on the quality of teaching
- Formal peer review of teachers and teaching

The results of these evaluations are put to different purposes.

Reviews

Reviews of courses and programs are used to inform curriculum redesign, addressing issues of content currency, ensuring alignment of the program with the needs of society, industry, registration bodies, and checking that programs are coherent with developments in theory and practice of the relevant discipline. Sometimes reviews of this nature highlight waning disciplines or significantly diminished market demand, and result in the disestablishment of courses or programs. At the ANU, policy dictates that five-yearly reviews are conducted of academic areas, with Terms of Reference based on – among other things – the quality of education, national needs and priorities, effective international connections, and relevance to the future. These reviews generally include a look at the academic programs managed by the area.

Moderation

Moderation activities, as discussed earlier in this booklet, focus on the effectiveness of a given assessment strategy in assisting academic staff to make judgments about student achievement and on strategies for building a shared understanding of academic achievement standards (both teacher-to-teacher and teacher-to-student). The ANU participates in a range of student satisfaction surveys, and uses the results to influence decisions about the way courses and programs are designed, developed, and delivered. Of prime importance to academic staff are the local student satisfaction surveys, known collectively as SELT at the ANU. These comprise the SELS single instrument, and the suite of instruments known as SETs. Reports on SELS data are published on the University website, and reported to management and supervisors. Reports on SET data, on the other hand, are made available only to the individual concerned, who has the right to refuse to share the information. Some academics do share their personal SET reports with their supervisors, usually in negotiations about Statements of Expectation (the ANU’s performance management tool). They are not required to do so. Others include the results in their teaching portfolios, which are used in applications for promotion or in submissions for teaching awards. In any case, sharing of SET data is voluntary.

Information about all the student satisfaction surveys administered by the ANU is available from the Planning & Statistical Services Division’s website: http://unistats.anu.edu.au/surveys/.
processes associated with moderation activities are generally less formal, with each academic area operating to a local plan.

**Student satisfaction surveys**

Student satisfaction surveys fall into one of two categories, e.g. those conducted during programs – e.g. institution-specific course-level student satisfaction surveys like the ANU’s SELS – and those conducted after graduation – e.g. the Course Evaluation Questionnaire (CEQ), for example. Data collected from these surveys is reported and used in different ways. For example, some results are used to answer management questions (Which courses are performing badly? What services need upgrading?) and some are used to assist university teachers to plan their own professional development (How can I improve my teaching practice? What courses should I do? Which delivery mechanisms would suit my students better?). Some results are reported publicly and some are reported only to the individual to whom they apply.

Most student satisfaction surveys and the way they are used in Australia and the UK have been strongly influenced by the work of Paul Ramsden and H. W. Marsh. Ramsden’s view is that we can only improve the quality of university education if we study its effects on students and look at the experience through their eyes (Ramsden, 2003). H. W. Marsh is an educational psychologist, currently working at the University of Western Sydney after several years at Oxford University. His work on evaluation of teaching quality and educational effectiveness and the peer review process has been highly influential.

Marsh’s work was published first, and was popularised through Ramsden’s advocacy of the notion that student satisfaction is an excellent proxy measure of the quality of teaching. Marsh was the original architect of many of the surveys still in use in Australia and the UK. Those familiar with the old ANUSETS will see echoes of his work in those instruments.

Marsh wrote:

“In a meta-analysis of all known research, I found that the correlation between teaching and research effectiveness was almost exactly zero – good researchers were no more or less likely to be good teachers, and good teachers were no more or less likely to be good researchers. It is important for universities to change this and to build and reinforce this synergy. One way to do so is to improve the quality of, and value placed on, teaching. … Professional development should include systematic evaluations of individual teachers, as well as teacher training programmes. Students’ evaluations of individual teachers at the end of teaching units are used for feedback to teachers, interventions to improve teaching effectiveness, personnel decisions, and as information for students when selecting teachers and courses. There is a huge research literature largely in support of their reliability, validity and usefulness. Although student ratings continue to be controversial, empirical support for them is stronger than most personnel evaluation systems. There is no research evidence for many suspected sources of bias or "urban myths". For example, contrary to one popular myth, more difficult and challenging courses tend to get high ratings, not low ones. Class-average ratings by students are valid in relation to diverse criteria. In highly rated classes, students do better on objective measures of learning and are more motivated to pursue the subject, while teacher self-evaluations of their own teaching effectiveness are also higher. Students differentiate between components of teaching effectiveness such as organisational skills, breadth of coverage, learning/value, enthusiasm and assessment; different teachers have different strengths and weaknesses in relation to specific components that can be addressed by tailored interventions. Feedback from ratings, coupled with systematic intervention, leads to better teaching. Without feedback, teachers do not improve with experience.”

(Marsh, 2011)
One might add to the final sentence in this quote: “Without feedback, teachers just like their students, do not improve with experience.”

The concept of feedback is one that often crops up in discussions about student satisfaction surveys. Across the board, when the results of student satisfaction surveys are compared, Australian institutions are criticized for the amount and quality of feedback they provide for their students. Sadler, in a presentation at the ANU in 2011, suggested that one way to change these results is to make sure that every time a staff member provides feedback at a class or individual level, he (or she) should preface his remarks by saying something like, “Now, I am about to give you some feedback”. That is, not only should academic staff provide extensive formative feedback, they should be pointing out each time that they are providing feedback, by naming and highlighting the process.

Some academic staff members run personal evaluation surveys or data collection strategies as part of their formative assessment strategy. They use the data to modify curriculum on the run. While it is usually not possible to change the topics that are covered in a course, it is certainly possible to make changes to the teaching and learning activities used in a course, or to allocate a longer time to certain difficult topics. These are not strictly student satisfaction surveys as they are best known, but they provide useful formative feedback for the teacher.

Peer review of teaching

Peer reviews of teaching are less common in Australian higher education, but they are being discussed more frequently as time goes on. This stems, in part, from the difficulty we have in assessing the quality of teaching. Most of the measures used to assess the quality of teaching are proxies: student attainment, student satisfaction, employment rates post-graduation, the percentage of graduates who go onto further study, and employer satisfaction, to mention a few. It may be that the quality of teaching is less important than the impact or influence a teacher has, and that therefore these proxies do provide us with the important information. At some stage, though, it is useful to know whether or not a university teacher is good at the job and can demonstrate competence.

Peer reviews of teaching have four possible purposes. University academics new to the job need to know where their weaknesses are so that they can seek out learning experiences that will assist them to improve. University academics who have been teaching for some time need to know whether their skills and knowledge are still up to scratch. Lecturers who are preparing portfolios for promotion or for submission for awards might commission such reviews so that they can demonstrate excellence. Alternatively, such reviews may be useful in identifying weaknesses in teaching practice, and might be commissioned, for example, by an academic supervisor who has concerns about the ability or focus of a team member.

Among the expertise and proficiencies that a university teacher needs to demonstrate are the following:

1. Content / discipline expertise
2. A current research profile
3. Classroom management techniques
4. Performance techniques
5. Listening and questioning techniques
6. Skills with technology: audio-visual equipment, presentation software, learning management systems, desktop videoconferencing software, etc
7. Online moderation and facilitation skills
8. Curriculum design, development, documentation, and implementation skills
9. Familiarity with the institution’s curriculum approval processes and procedures
10. Familiarity with the institution’s student appeals processes and procedures

At present there are few formalized moderation or peer review activities in place in the College. Given the increasing emphasis on metrics and education, it is possible that these may become more common at the ANU in the near future – and it makes sense to model our assessment of quality in teaching on the way we assess quality of research.
The Course Outline

Finally, you will need to prepare a curriculum document for your students, outlining the course, as they will experience it. The ANU has a template, available from the CASS website (see http://cass.anu.edu.au/intranet/education/curriculum-design). Use of this template will be compulsory from the end of 2014. In the meantime, you may tailor the template to suit your own preferences.

A Final Comment

Teaching is a vocation and an art; the performance of the master requires grace, passion, and beauty.

Teaching is a science, with a strong theoretical foundation built on the work of developmental and cognitive psychologists, social scientists, and neurologists.

Teaching is a craft, demanding technique and technical expertise from its practitioners.

And teaching is alchemy, creating a magical space of limitless possibilities from enthusiasm, joy, discomfort, and personal chemistry.

*If you want to build a ship, don't drum up people together to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea.*

— Antoine de Saint-Exupéry
Glossary

Alignment: In educational terms, alignment refers to the way in which certain curriculum elements – learning outcomes, teaching and learning activities, and assessment – are interdependent. Implementation of a successfully-aligned curriculum ensures that students are taught the material they need to know to complete successfully the tasks set for (summative) assessment, and that the assessment strategy is designed to provide the teacher with the evidence he or she needs to make an informed judgment about how well students have achieved the stated learning outcomes. (cf. Constructive alignment)

Andragogy: The scholarly approach to the teaching of adults. (cf. Pedagogy)

Assessment: In the Australian context, the term “assessment” is used to describe the strategies put in place to allow teachers to gather evidence of student progress and academic achievement, and to judge how well students have achieved the learning outcomes for their course of study. (cf. Evaluation)

Competency-based learning: Competency-based learning, frequently found in a training context, provides learners with the skills, knowledge, and expertise to demonstrate competence against performance criteria in an applied context, frequently the workplace, or a vocational education and training institution. Importantly, progress in a competency-based program is not based on time; rather, as soon as a student has demonstrated the required competence, he or she is free to move on to the next module of study.

Constructive alignment: Constructive alignment, a notion first described by John Biggs, represents a marriage between a constructivist understanding of the nature of learning and an aligned design for outcomes-based teaching education. (cf. Alignment)

Convergent assessment: Assessment for which there is one true answer. (cf. Divergent assessment)

Criterion-referenced: In assessment, criterion-referencing refers to an assessment strategy in which a student’s grade is determined by how well he or she has achieved the stated learning outcomes by comparing his or her assignment or presentation with clearly stated marking criteria. A true criterion-referenced assessment scheme does not have a pre-determined grade distribution. (cf. Norm-referenced)

Curriculum: The term “curriculum” covers a wide range of aspects of the student learning experience, including learning outcomes, scope and sequence of knowledge (syllabus), detail of content, skills, learning experiences, resources, pedagogy, assessment, evaluation and review, and reporting. In essence, it is a description of the formative experiences available to a student enrolled in a particular course of study, of the academic achievements expected of a student who successfully completes the course, and of the ways in which that student’s achievements will be reported. (cf. Syllabus)

Diagnostic assessment: Diagnostic assessment is a type of formative assessment used early on in a course or program, to evaluate students’ abilities to identify their own approaches to learning, to assist students to develop the skills to manage their own learning, and to provide the teacher (and students) with information that will allow the identification of deficits in knowledge and understanding. Diagnostic assessment helps both teacher and student to establish a baseline for learning.

Divergent assessment: Assignments which require students to provide an analysis and to justify their interpretation of the situation. (cf. Convergent assessment)

Evaluation: In the Australian higher education context, the term “evaluation” is generally used to refer to the assessment of quality, of student satisfaction, and of the process of review (of curriculum, content, quality). (cf. Assessment)

Feedback: see Formative feedback.

Feedforward: see Formative feedback.

Formative assessment: Formative assessment is any learning activity that will assist the teacher to identify deficiencies in student learning to date, design future learning tasks to address these deficiencies, and provide students with feedback that will assist them to improve their performance in summative
assessment activities. Formative assessment may be marked, but that mark will not count towards a final grade. (cf. Summative assessment)

**Formative feedback**: Formative feedback is any commentary on student work that is designed to assist students to improve current or future learning. It takes one of two forms: “feedforward”, which is information that will assist students to complete future tasks more successfully, and feedback designed to explain to students why they were allocated a particular mark. “Feedforward” may relate to tasks in the later part of a course, or may relate to tasks that students will encounter later in their program.

**Grades**: Grades are letters that correspond to bands of marks, usually according to an institution-wide scale, e.g. where students who get a numerical mark that corresponds to 80-100% of the total marks available for the course will be awarded a grade of High Distinction (HD). (cf. Marks)

**Hidden curriculum**: The “hidden curriculum” is informal curriculum constituted by staff expectations, when there is a mismatch between unspoken staff expectations and the formal documented curriculum. The hidden curriculum describes those aspects of the curriculum that go unidentified in learning outcomes and marking rubrics, but which nevertheless are assessed implicitly.

**Integrative assessment**: Integrative assessment describes tasks that have the primary purpose of influencing students’ approaches to future learning. These tasks might include activities that define and track strategies that students use to assess their own learning abilities and problem-solving capabilities, that ensure that students understand how their work measures up against relevant standards, and that they might use to enhance their ability to adapt their learning to future scenarios. The artefacts of integrative assessment would only be marked/graded only if life-long learning skills were identified in the learning outcomes of a course or program.

**Learning outcomes**: Goals that describe what successful learners will be able to do at the end of a course of study.

**Learning Management System**: A Learning Management System is a software application which provides tools that assist with the administration and delivery of online education.

**Marks**: These are the numbers allocated to student work, based on the criteria used to assess individual pieces. If a marking rubric is used, the possible total number of marks allocated to a piece of work may be broken down according to the different criteria, and the total allocated to the marked work the sum of those allocated to each criterion. (cf. Grades)

**Moderation**: Moderation is the term used for a range of collaborative practices before, during and after an assessment is designed and implemented that assists teachers to benchmark standards and marking practices, ensuring common and shared understanding of academic achievement standards, marking criteria, and fair marking practices.

**Norm-referenced**: In assessment, norm-referencing refers to the process of ranking the raw scores achieved by students in a particular cohort and awarding grades according to a pre-determined distribution scheme. Frequently, this involves spreading the grades to fit a “bell curve” (a “normal distribution” in statistical terms). (cf. Criterion-referenced)

**Pedagogy**: The method and practice of teaching; the function, work or art of a teacher; originally used to refer to the teaching of children, now used to refer to most kinds of teaching. (cf. Andragogy)

**Research-led education**: The notion of research-led education is still under debate, but there seems to be an agreement that it includes the provision of learning experiences which ensure that students have opportunities to learn about research, how to do research, and through research of their own.

**Rubric**: This term originally referred to text in red ink in religious manuscripts (or the red ink itself) used to highlight elements in medieval documents. These sections or words included, for example, instructions for the cleric interposed between the black text (the words spoken during services). Over time, the meaning of the word was extended to mean instructions of any kind, and more recently has become a abbreviation of the term “marking rubric”, the instructions for allocating (and to some extent explaining) marks for a student assignment based on specified criteria or academic achievement standards.
Scaling: The term scaling, when used in the Australian higher education system, generally refers to the practice of adjusting the marks of a group of students, e.g. a class cohort or a tutorial group. Scaled marks may be adjusted up or down, usually as the result of a statistical calculation. Scaling is legitimately used when, for example, the average mark allocated to a particular cohort of students is considerably higher or lower than the performance demonstrated by the same cohort in other assessment items for the course, or in other courses. However, scaling should always be used with caution, and it should not be used to disguise problems with teaching or to force marks to fit a bell curve. (cf. Grades and Marks)

Summative assessment: Summative assessment is any marked activity that assists the teacher to judge how well students have achieved stated learning outcomes. Summative assessment is always marked, and those marks always count towards the final grade. Feedback that is formative in nature may be provided on summative assignments, particularly when there has been little opportunity for formative assessment during the semester. Summative assessment is used as a proxy for learning, and for progression and certification purposes. (cf. Formative assessment)

Syllabus: An outline or summary of the material covered in a course of study. (cf. Curriculum)

Teaching and Learning Activities: The transactions and interactions between teachers and students whereby students acquire the skills and expertise set out in the curriculum, and which they need to complete successfully the summative assessment tasks required for certification.

Weighting (of marks): In weighting certain marks over others in an assessment strategy, the curriculum designer is valuing certain assessments more than others. For example, if you set two tests out of 20 marks that are of equal weight, then each test is worth half of the final overall mark for the course. If you set two tests out of 20 marks, and one carries a weight of 0.25 and one 0.75, the first is worth 25% of the overall mark for the course and the second 75%.

Example 1 (the marks earned by George in Course A)
- In Test 1, worth 50% of the assessment for the course, George gets 18 marks out of 20.
- In Test 2, also worth 50% of the assessment for the course, George gets 2 marks out of 20.
- Formula: \[ \frac{(18 \div 20) \times 100}{0.5} + \frac{(2 \div 20) \times 100}{0.5} = 50\% \text{ for the course.} \]

Example 2 (the marks earned by Alice in Course B)
- In Test 1, worth 25% of the assessment for the course, Alice gets 18 marks out of 20.
- In Test 2, worth 75% of the assessment for the course, Alice gets 2 marks out of 20.
- Formula: \[ \frac{(18 \div 20) \times 100}{0.25} + \frac{(2 \div 20) \times 100}{0.75} = 30\% \text{ for the course.} \]
References


