THE UNIVERSITY OF MELBOURNE

Creating Effective Websites for University Teaching

An educational framework

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This guide was developed for the University of Melbourne by Dr Kerri-Lee Harris of the Centre for the Study of Higher Education and Deborah Jones of Learning Environments, Information Services. The *LMS Framework* and associated principles were adopted by the Academic Board in September 2007.

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The particular terminology used to describe academic programs differs between universities. For the purposes of this document, the following definitions are used:

Subject = individual unit of study (eg Chemistry 101)
Course = complete program of study for a particular award (eg Bachelor of Science)

Contents

LMS framework for subject presence

Administrative and procedural information

Handbook entry

To avoid duplication of core subject information, and to assist with alignment between the handbook description and subject design and delivery.

•Link to handbook entry (automatically created)

Subject information

To provide students with a complete and current description of subject administrative processes.

•Names & contact details of teaching staff

•Schedule of topics and activities

•List of assessment tasks & due dates

•Explanation of how the LMS will be used in the subject

•Report of responses to student feedback from the previous student cohort

Assignment submission

To facilitate assessment administration for students and staff.

This involves: the online submission of assignments.

Grades and student progress

To record assessment results for providing students with information regarding their individual progress, and for determing subject grades.

Including: satisfactory completion of particular hurdle requirements; record of assessment submission; results for assessment tasks; overall grades; etc.

Information to support learning

Subject information

To provide students with an explanation of expectations in the subject, including details of assessment tasks.

•Subject requirements and expectations, including learning objectives.

•Explanation of the purpose of assessment tasks in terms of the learning objectives for the subject.

•Details of assessment criteria, and standards *(as appropriate).*

Readings and resources

To support students' independent study through ready access to downloadable resources, reading lists, and/or other information sources.

Which may include: lists of required readings; links to specific library resources; downloadable materials such as lecture notes and audio-recordings; additional readings; other audio-visual material; etc.

Feedback - from staff

To facilitate timely, explanatory feedback to students from staff.

Which may include: assignment submission with online feedback; etc.

Interactive and/or collaborative learning

Discussion

To facilitate collaborative learning through discussion and debate among students, and between students and staff.

Which may include: discussion boards; wikis; creative commons; synchronous video conferencing; etc.

Collaborative production

To facilitate collaborative learning through group projects and production.

Which may include: group-based document sharing; creative commons; etc.

Self-assessment

To provide opportunities for students to self-assess their knowledge and to test ideas through the use of interactive tools.

Which may include: simulations; self-assessment tools such as quizzes; interactive tutorials; etc.

Feedback - to and from peers

To provide structured opportunities for students to review and comment on one another's work.

Which may include: peer feedback tools such as PRAZE; etc.

Reflective practice

To develop learning skills and self-awareness through reflection on learning.

Which may include: learning portfolios; journals; blogs; etc.

Online, formal assessment

To enhance formal assessment through the use of online technologies, as appropriate.

Which may include: simulations, images etc incorporated into the assessment task; assessment tools such as quizzes; peer-feedback tools such as PRAZE; etc.

Version date: 10 April 2008

Summary list of key questions

How might a subject website be used to support university teaching and students' learning? The *LMS Framework* (p.4) provides a map of the various purposes for which a subject website might be used. The following list of key questions are based on the framework and may serve as a checklist for subject coordinators. Each question is further elaborated in Part 2.

Administrative and procedural information

Handbook description
How is it ensured that the formally approved subject description given in the University Handbook is consistent with the additional information presented on the subject website?

Subject information
How complete and current is the description of administrative processes regarding the subject?

Assignment submission
How is the subject website used to manage assignment submission for the benefits of staff and students?

Grades and student progress
How is the subject website used to record assessment results for providing students with information regarding their progress, and for determining subject grades?

Information to support learning

Subject Information
What is explained to students regarding assessment and other expectations?

Readings and resources
How are students directed toward core and other relevant learning resources for the subject?

Feedback from staff
How might the subject website be used by staff to provide students with effective feedback on their learning?

Online, formal assessment
How might online tools be used to provide enhanced forms of formal assessment?

Interactive and/or collaborative learning

Discussion
Is there benefit to enabling and encouraging online discussion, and how might it be used?

Collaborative production
If students are required to collaborate in order to produce a piece of work, are there possibilities to support this through the subject website?

Self-assessment
Are there interactive tools that students can use to test their knowledge and ideas?

Feedback to and from peers
How can the technologies be used to encourage and support peer review?

Reflective practice
How can the technologies be used to encourage and support reflective practice?

Part 1: Introduction

Online technologies make a powerful contribution to university teaching and learning. The widespread adoption of learning management systems in higher education and the prevalence of subject-based websites reflect this. It is not only distance education students who benefit from the potential of online support for university subjects and the various developments captured under the banner of 'e-learning'. Campus-based students also benefit from ready access to information and opportunities for online communication and interaction.

From the advent of the internet, universities have been exploring the ways in which an online presence for subjects can be used to support teaching and learning. In response, various software systems have evolved specifically to support the creation and management of subject websites. The trend has been toward combination of website design tools and software into integrated packages, and these have come to be known as 'learning management systems'. The intent behind the design of such systems has been to provide ease of use for staff, including in most cases the facility to link to other university information systems. The term 'LMS' is now widely used to refer, generally, to any suite of systems that supports subject websites, and as a result subject websites are often referred to as 'LMS sites'.

With the rapid expansion of available online technologies, university teaching staff are presented with both opportunities and challenges. There are opportunities to include novel learning activities, to create and access information in new ways, and to extend interaction between staff and students beyond time in class. There is support for staff in the administration of subjects and the coordination of teaching teams. With these opportunities come challenges, including the need to reassess priorities – particularly with regard to the intended learning outcomes, and the time and resources available.

Subject websites are used for a variety of purposes in higher education. They are a convenient and effective means of providing administrative and procedural information about the subject. They are also extensively used to provide information that supports students' learning in the subject. This includes descriptions of particular learning tasks, information such as readings and links to web-based information and downloadable resources, and explanations of what is expected of students – particularly regarding assessment. In addition, subject websites provide a variety of mechanisms to support the provision of feedback to students, and to facilitate interaction and collaboration.

The online environment of subjects is an integral component of curriculum planning. One of the tasks faced by subject coordinators, therefore, is the need to make decisions about how a subject website can be incorporated into the overall teaching of a subject – and in such a way that it promotes the learning intended.

The University of Melbourne's *LMS Framework*

The University of Melbourne recognises the importance of information technology to teaching and learning. While a campus-based University, most subjects are supported and enhanced through an online presence. Students have ready access to information to support their learning and to technologies that enable online collaboration and interaction.

The *Nine Principles Guiding Teaching and Learning* forms the basis of teaching and learning policy at the University of Melbourne. In describing the role of technology, the *Nine Principles* document includes the following statement:

> *The ways e-learning strategies and their accompanying resources are deployed within the curriculum should reflect the educative principles of the present document. The effectiveness of technologies for teaching and learning can be measured therefore by the extent to which they enhance the excitement of learning, facilitate communication and discussion between students and staff and provide students with greater opportunities for practice and feedback — for, as Laurillard (1993) argues, multimedia and educational technologies in the hands of expert university educators greatly*

expand the opportunities for students to rehearse and articulate their knowledge (p14)
Source: http://www.cshe.unimelb.edu.au/pdfs/9_Principles.pdf

The University of Melbourne's *LMS Framework* (p.4) was developed in 2007 in response to an identified need to promote and support a sound educational basis for the use of various technologies in teaching and learning. The first stage of development involved extensive consultation with staff from across the University, including the Teaching and Learning Development Committee and the LMS Governance Board. Contributions from Peter Tregloan and Alan Arnold, members of the working group responsible for initiation of the project, are specially acknowledged. The *LMS Framework* and associated principles were endorsed by the University's Academic Board in September 2007.

Principles behind the *LMS Framework*

The University of Melbourne's *LMS Framework* is based on four fundamental principles:

1. Subject websites serve multiple purposes

An online subject presence can be used for a variety of academic purposes. These purposes range in complexity from the simple yet important provision of administrative information and learning resources, to the inclusion of elaborate systems for student collaboration and interactive feedback. Subject websites also provide support to teaching staff in terms of administration and coordination.

2. Planning should be based on identified academic purposes

Academic purpose, rather than the technology, should underpin the design of a subject's online presence. While awareness of new and emerging technologies is important, the potential for their use should be assessed on the basis of identified academic purpose, not availability.

3. Diversity between subjects is appropriate

University subjects are diverse and it is appropriate that this diversity be reflected in the design of their online presence. Many subjects make extensive use of online assessment, interaction and collaboration, and to very good effect. For other subjects, the most effective and appropriate subject website design is relatively simple, including no more than carefully considered subject information and resources. Differences in the learning objectives of particular subjects and courses will influence the priorities given to particular purposes. Similarly, differences between disciplines and year levels will have an influence, as will the needs of particular student cohorts.

4. Students will benefit if particular elements are considered 'core' for all subjects

Detailed subject information, including information about assessment, readings and resources, are elements relevant to all subjects. It is therefore appropriate that some elements be considered 'core' – likely, if not essential, elements of all subject websites. Students benefit from ready access to this level of information and support for all their subjects.

The guide *Creating Effective Websites for University Teaching*

Creating Effective Websites for University Teaching presents a conceptual framework for making decisions based on purpose, rather than technology. It is a practical tool that presents the options and considerations in a question-based approach. The focus is on individual subjects. The diversity of subjects and disciplines is recognised – this document presents possibilities, not a prescription.

A guide for planning, based on identified purposes

The *LMS Framework* (p.4) presents the various academic purposes an online presence can serve in supporting students' subject-based learning. These purposes, represented as individual elements (ie, boxes), are grouped under three broad headings:

- Administrative and procedural information;
- Information to support learning; and
- Interactive and/or collaborative learning.

The first challenge coordinators face in the planning or review of subject websites is to identify the particular elements of an online presence most appropriate to their particular subject. *Creating Effective Websites for University Teaching* is designed as a practical guide to assist with this aspect of curriculum design and subject website planning. Each of the individual elements of the *LMS Framework* is explained, in turn, and accompanied by a series of trigger questions for consideration (Section 2).

Creating Effective Websites for University Teaching is purposefully comprehensive. For this reason, some of the information will be self-evident, and not all of the possibilities presented will be relevant to every subject or discipline. While developed principally for subjects with a face-to-face component, this document can also be used for planning fully online subjects.

This is not a technical manual

The document does not address the technical details of working with software to create subject websites. There are numerous learning management system (LMS) manuals and resources available which describe, for example, how to create and manage LMS-based subject websites, and how to incorporate tools such as discussion boards and quizzes.

Nor is this guide about learning management systems *per se*. Although an online subject presence usually originates within a university-supported LMS (e.g. Blackboard), some subjects may involve more than one such system and most will include links to other websites, resources and even online tools external to university information systems.

For example, Appendix 1 illustrates the systems relationships for subject websites at the University of Melbourne.

For comprehensive review of subject assessment

Assessment is an important feature of this guide. Using this document to review the assessment possibilities created by an online environment is therefore likely to prompt review of assessment more generally. Users of this guide are, however, encouraged to refer to additional resources when the principal focus is assessment review. The *Guide for Reviewing Assessment* is a CSHE resource based on recognised principles of effective university assessment. It is a document complementary to the *Creating Effective Websites for University Teaching*.

The *Guide for Reviewing Assessment* is available from http://www.cshe.unimelb.edu.au.

Who might use this guide?

Subject coordinators

The focus of this guide is on individual subjects. For this reason, the document is designed primarily for subject coordinators. It is intended to assist in planning the online subject presence for particular subjects.

Course coordinators

The document may also play a role in course planning in terms of mapping online activities across a course of study.

Academic support staff

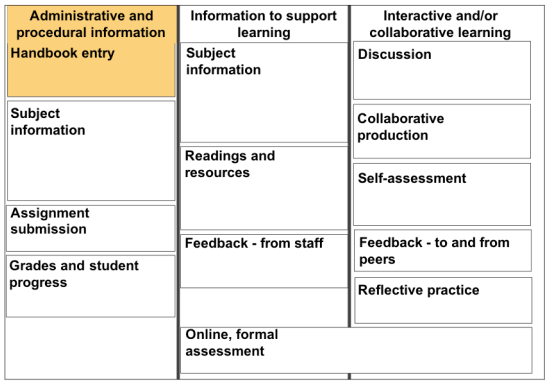
In addition, the *LMS Framework* and the guide may prove useful for planning and presenting academic support programs for staff. It provides a reference point, based on purpose, within which the use of particular tools and teaching and learning approaches can be discussed.

Institutional policy makers

Similarly, the guide can be used to facilitate discussions around institutional policy and priorities in areas such as: institutional expectations for online subject presence; provision of particular infrastructure, systems and tools; and allocation of resources for academic and technical support in identified areas.

Part 2 : Guide for planning individual subjects

Handbook description: avoiding duplication of core subject information, and assisting with alignment between the handbook description and subject design and delivery.



The University Handbook typically contains the information necessary to gain formal subject approval from the relevant University committees. The Handbook description for each subject includes such information as: a brief subject description; a list of learning objectives and generic skills; staff names; and details of prerequisite study.

The Handbook description is:

- important as it defines the official parameters for the subject including some aspects of assessment;
- often minimalist, particularly with regard to assessment task details, criteria and expectations;
- usually prepared well in advance, and is therefore deliberately general to allow flexibility in curriculum details and specific approaches to teaching and learning; and
- unable to reflect subsequent changes to teaching staff.

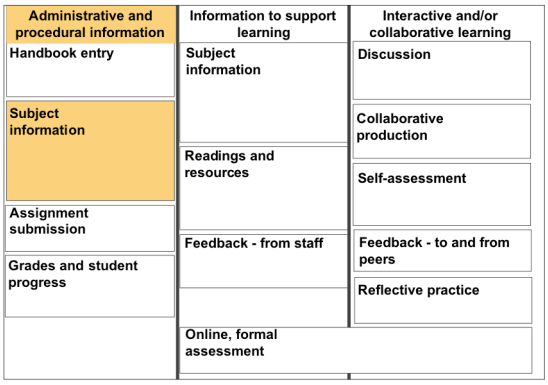
A link from the subject website to the Handbook description serves two purposes:

- The need to replicate information such as subject prerequisites and lists of learning objectives is avoided; and
- Students and staff are encouraged to review this information during semester, as appropriate.

How is it ensured that the formally approved subject description given in the University Handbook is consistent with the additional information presented on the subject website?

- Is the Handbook entry available online? If so, does the subject website include a link to this online entry?
- What is the process for requesting changes to the Handbook entry, and who has responsibility for this?
- What information regarding assessment requirements is listed in the Handbook entry?
- Is it permitted to make changes to assessment in the subject without first making changes to the Handbook? If so, what is the process?

Subject information: **providing students with a complete and current description of subject administrative processes.**



Much of the information that was traditionally distributed through paper-based handouts in Week 1 or posted on departmental notice boards is now more effectively made available online. Providing this information via the subject website offers several advantages:

- The information can be updated as required, ensuring that students always have access to the most current information.
- All relevant information is available in one place.
- Students can access the information anytime and from any computer with internet access.
- There are significant resource savings in terms of paper and printing, particularly in large subjects.
- Links to other websites or resources can be used to enhance the information provided, to avoid duplication of effort, and to streamline the management of this information.
- Coordination and communication for teams of teaching and support staff is facilitated.

How complete and current is the description of administrative processes regarding the subject?

Names and contact details of teaching staff

- Are students able to identify which individuals to contact for particular purposes? What contact details are provided (e.g. office location; email; consultation times)?
- Is the information kept current? Who takes responsibility for this?
- Is there benefit in providing additional information, such as details of staff members' research through links to individual homepages?

Schedule of topics and activities

- Are students provided with an overview of the sequence of subject topics to be addressed in classes or through structured activities (e.g. list of lecture and tutorial topics, with sufficient detail to enable students to prepare in advance)?
- If there are changes to the schedule of topics, who ensures that the information on the subject website is updated?
- Can the schedule be used as a basis for linking to related readings and resources, and/or other components of the subject website?
- Is there benefit in including a suggested schedule for out-of-class learning activities, such as assignment preparation?
- Could the schedule be structured to represent a 'subject map' which illustrates the relationships between learning objectives, classes, independent learning activities, assessment, and resources?

List of assessment tasks and due dates

- Is a complete list of assessment tasks provided, including the relative weightings and due dates for each?
- Is information regarding assignment submission processes provided (e.g. how to obtain cover sheets; where and/or how to lodge assignments, including a link to online submission if appropriate)?

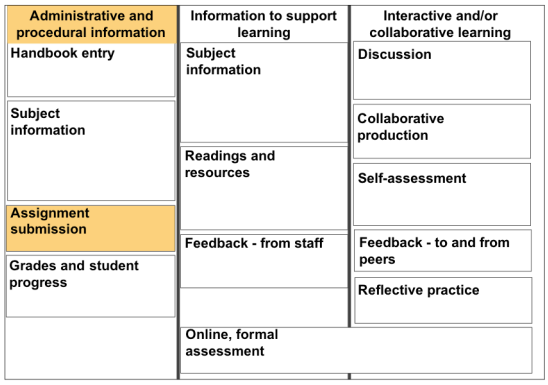
Explanation of how the subject website will be used

- What orientation is provided for students regarding the structure of the subject website?
- How are the purposes of various elements explained to students?
- Are expectations of how students will use the subject website made explicit? For example, if students are expected to check the site regularly and to participate in online collaboration, is this stated and explained?

Response to feedback from previous student cohorts

- Are students informed of the *response* to feedback from previous student evaluations of the subject? For example, feedback from students might have led to changes in the explanation of assessment tasks, or the inclusion of additional resources.
- Is it a requirement that *summary results* from previous student evaluations be made available to students? If so, is this information posted on the subject website?

Assignment submission: facilitating assessment administration for students and staff.



Carefully designed facilities for online assignment submission can greatly benefit teaching staff, administrative support staff, and students.

The greatest potential beneficiaries of online assignment submission are the staff responsible for collecting, collating and redistributing assignments for large student cohorts. In some departments this is a major logistical exercise, requiring that hardcopy submissions be date-stamped, recorded, securely stored, and sorted for distribution to teams of assessors. Online submission can effectively simplify and streamline this process. Obviously, to achieve this the system must be robust and reliable, and appropriate to the types of specified assignment format.

Online assignment submission may also be integrated with other online assessment features, including the provision of feedback and the record of grades (See also*: Feedback from staff*; *Grades and student progress*).

Online assignment submission can also assist students by providing a convenient and secure means of lodging assignments. It is critical, however, that students are provided with sufficient introduction to the use of the system, and support should they encounter problems.

Online submission may also be combined with additional tools, such as those that test written work for originality and indications of plagiarism.

How is the subject website used to manage assignment submission for the benefits of staff and students?

- Are students developing and producing assignment work in an electronic form? If so, could administration of the submission process be streamlined or enhanced through online submission?

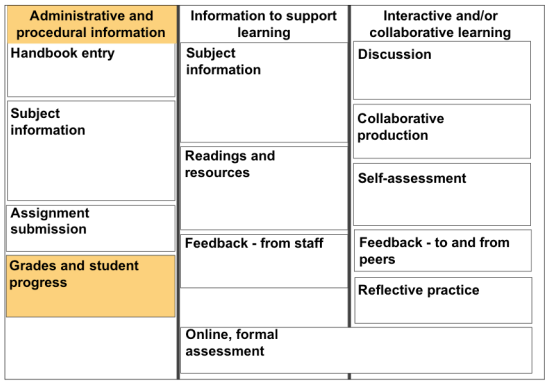
  Specific considerations:

  - What form or variety of forms does the work take (e.g. text; audio; video; combination), and therefore what file formats are appropriate?
  - What file format will best preserve the integrity of the work across different computer operating systems?
  - Is there a need for file compression? If so, how will this be achieved?
  - Will all students have access to the necessary software?
  - Are students provided with detailed advice, and is support available should they experience difficulties?
  - What confirmation of successful lodgment do students receive?
  - Is hardcopy submission an option?
  - Will documents require printing prior to distribution to assessors?

- If students need to choose from a list of possible assignment topics, can this be managed online?

Grades and student progress:

recording assessment results for providing students with information regarding their individual progress, and for determining subject grades.



Just as they provide a single, accessible point for communicating subject details, subject websites can also serve as the site for collecting and making available information about individual students' progress within the subject.

The potential of this function is significantly enhanced where sites incorporate a learning management system with tools for managing student-specific information. Such tools can:

- Ensure confidentiality by managing the security of access. This is particularly critical for the record of grades, but is also an important consideration for other information specific to individual students' progress, such as the completion of hurdle requirements, or records of assignment submission;
- Draw information from other feedback tools, such as those that allow staff to enter comments and percentage scores;
- Automate the allocation of a grade (e.g. 'Credit') on the basis of a percentage score (e.g. 67%);
- Automate the calculation of an overall score and/or grade, based on multiple pieces of assessment;
- Export the data to other student information systems, or in file formats (e.g. spreadsheets) appropriate for subsequent processing; and
- Provide reports to teaching staff, alerting them to outstanding tasks and other possible indicators of students in need of additional support.

Using the subject website as a point of recording, accessing and collating student-specific progress data has benefits for:

- Students, providing ready access to their record of progress in the subject;
- Teaching staff, providing a mechanism for 'lodging' grades and other information; and
- Subject coordinators, as a means of collecting and collating student records.

Despite the potential benefits of some LMS tools for managing student records, it is important to recognise that full automation of results processing may be both unnecessary and undesirable. Most universities have well-established and robust processes for checking and moderating assessment results. With careful planning, however, subject websites and LMS tools can be used to support such processes.

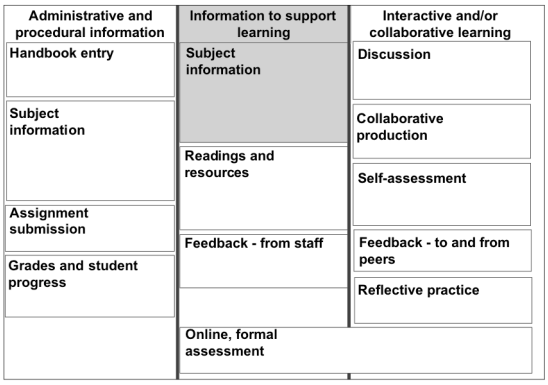
How is the subject website used to record assessment results for providing students with information regarding their progress, and for determining subject grades?

- Are there in-semester assignments that students submit via the subject website? If so:
    - Can students subsequently check that their submission has been received?
    - If the task is graded, can the results be recorded using the LMS tools? And if so, can the grade be made available to students?
    - When should this information be made available (e.g. at a predetermined date; only once grading of all students' assignments is complete)?

- Are there other required tasks or activities that are not assessed? If so:
    - Can task completion be recorded on line? And if so, is task completion recorded by staff, or by individual students' self-reports?
    - If the data is self-reported, how is it verified (e.g. students submit a written report; students enter contact details for work placement referee)?
    - Can students subsequently check the record of completion?

- Who should have access to the information?
    - Is there benefit in providing students with access to class averages and/or distributions, in addition to their own grades?
    - Which staff require 'read and write' access? Is there a broader group of staff who require 'read only' access?
    - Are all staff who have access familiar with protocols concerning the confidentiality of student records?

Subject information: providing students with an explanation of expectations in the subject, including details of assessment tasks.



It is common practice for the first class in a subject to include a description of the intended learning – the key topics to be covered and their importance to the discipline, the types of learning activities and how these interrelate, and the type of assessment involved. It is less common for an explanation of how these specific activities relate to the overall learning objectives for the subject. The latter are commonly presented as lists of attributes, skills or outcomes in the Handbook entry or elsewhere, but rarely is the connection between these and the learning activities, including assessment, made explicit.

Similarly, while it is common practice and relatively simple to provide students with descriptive information about assessment requirements –the topic, word limit and due date for an essay, or the style of questions used in a test, for example – helping students understand expectations in terms of both criteria and standards requires more careful planning and, perhaps, creativity.

All students are better able to engage with a subject if they have a clear understanding of the purpose of particular activities, and of what is expected of them. This is particularly true, however, in the first semester of a course – undergraduate first year, or the beginning of a postgraduate course – where students are unlikely to know just what they are expected to do or be aiming to achieve.

Subject websites can be used in a variety of ways to communicate to students the expectations in the subject. For example:

- A simple written explanation of the relationship between classes, assessment, and students' independent study. This can provide a reference for information given in the first class – but often forgotten or missed in the inevitable confusion of the beginning of a semester.
- A matrix, illustrating the relationships between students' in and out of class learning, including the assessment. Some subjects use this as the base for linking to related resources and additional information, and add additional links as appropriate throughout the subject.
- A 'frequently-asked questions' list, addressing common concerns with explicit and specific information and advice. This can be initially constructed based on awareness of issues from previous years and predictions, and can then be extended on the basis of questions asked by students during semester.
- For each assessment task:
    - A description of its purpose. This is particularly important for group projects and oral presentations, and sets the scene for describing the criteria against which the work will be assessed;
    - The assessment criteria, and their relative contribution to the overall assessment; and
    - Where possible, description or illustration of the standards expected. For example, for each assessment task what standard of work is considered satisfactory and what is needed to achieve a higher grade.
- Non-text forms of information such as video and audio.

The ability to update and build this information over the course of the subject is one of the major advantages a subject website has over, for example, a printed subject guide or handout. It enables staff to respond to the particular needs of the student group, and complements other forms of communication such as email. And it builds a resource which can be adapted and used for teaching the subject in subsequent years.

What is explained to students regarding assessment and other expectations?

Subject requirements and expectations, including learning objectives

- How do students know what is expected of them, both in class and during their independent learning in the subject?
- Is there benefit in highlighting the different contributions that particular components of the subject make in terms of the overall learning objectives? For example, would an explicit statement about the role of tutorials and their relationship to other aspects of the subject such as lectures or assessment tasks be helpful to students?

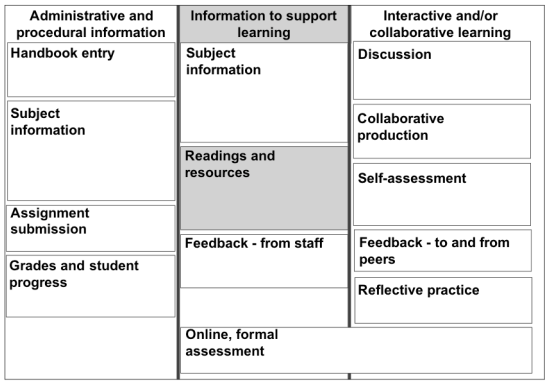
Explanation of the purpose of assessment tasks

- Are the purposes of assignments (e.g. critical essays; research projects) and other learning tasks such as group work and oral presentations explained?
- Do these purposes align with the stated learning objectives for the subject?
- If there is a final examination, is its purpose made explicit? For example, is it designed to test students' recall and comprehension of information, or does it focus on other skills (e.g. problem-solving, critical analysis or written expression)?

Details of assessment criteria and standards

- Are the criteria for assessment tasks made explicit? Is this information made available to students at the time they are preparing for the assessment? This applies equally to major assignments, and to test questions.
- How are students informed of the standards required in the subject? Is it possible to describe work of different standards, or are illustrative examples or exemplars more helpful?
- Is there benefit in describing standards for individual criteria? Are matrices or 'rubrics' helpful?

Readings and resources: supporting students' independent study through ready access to downloadable resources, reading lists, and/or other information sources.



While the ability to source information independently is often one of the objectives in a university subject, most subjects also provide students with specific resources or reference lists. Linking to this information from the subject website is simple, and has significant advantages over paper-based distribution. In addition, by following specified procedures or utilising dedicated systems, management of copyright and information access can be more efficiently addressed.

A wide variety of resources may be linked to a subject website, including downloadable files (e.g. PDF documents; audio files; images) and web pages outside the LMS. Type of resource aside, it is important to ensure there is a purpose to providing the material, and that that purpose is explained to students.

The source of downloadable files is an important consideration, particularly with regard to published work and copyright considerations. With the rise in popularity of 'open-access' publishing and various other forms of information sharing, the range of resources which can be directly linked from subject websites is increasing. However, copyright and 'fair-dealing' legislation is likely to remain a complex area for some time to come. It is for this reason that most universities provide central support for managing copyright compliance. Such systems take extensive advantage of digital and online technologies and are therefore ideally placed to support subject websites.

Systems to support content management (i.e. storage, retrieval and access) are often associated with learning management systems. Content files (e.g. PDF documents; audio files) can be uploaded and stored in one location, with varying levels of access assigned to the files, as appropriate.

Many subjects also provide teaching notes and materials, produced by the teaching staff involved and so available for distribution without restriction*, as downloadable files. The principal considerations in this case are file type and size, and where the file should be stored (e.g. on the LMS or elsewhere). Providing access to this material can be of particular benefit for: students for whom English is not their first language; students unable to attend class; and students with sight or hearing impairments.

Recordings – audio, video, or both – are increasingly being used in university teaching. The most common example is the audio recording of a lecture or seminar presentation, made available as a sound file for download. Universities often have centralised systems for managing audio recording in particular teaching spaces, and for storing the files produced. It is then a simple matter to link to this material from the subject website.

* Unless third-party information, images etcetera are incorporated, in which case copyright is an important consideration.

How are students directed toward core and other relevant learning resources for the subject?

Study and revision materials

- Are lecture notes and/or other class materials made available?

  If 'yes':

  - When is it provided (i.e. before or after class)?
  - For what purpose (e.g. preparation for class; use in class; revision)?
  - How are students informed of the purpose and encouraged to use the material?

  If 'no':

  - Is the reason made clear to the students?
- If the subject includes set readings, are links to electronic versions provided where possible?
- Does the university recommend a system or offer a service for coordinating and managing access to published resources (i.e. ensuring copyright compliance)? How are students advised of their copyright responsibilities (e.g. has a notice regarding restrictions to further distribution been included)?
- Are there other online resources that would particularly support students' learning in the subject? For example:
  - Open-access course material from other institutions;
  - Resources associated with recommended/prescribed textbooks;
  - Images or other material that illustrates particular topics.
- Is there benefit in providing access to examples of work by previous students? If so, does such material include a statement (e.g. cover sheet) detailing restrictions to distribution? Is the purpose of providing this material explained to (current) students?

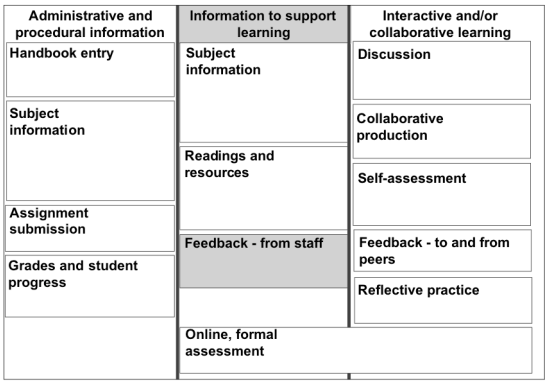
Research and further reading

- Is there benefit in providing links to recommended databases for information searching?
- Are there particular organisations that are relevant to the subject (e.g. government departments; professional associations)? If so, would providing links to their websites encourage students to familiarise themselves with this information source?

Study skills information

- Are there particular study skills that are important for success in this subject? If so, can links to relevant study skills resources be provided? For example:
  - Does the library provide guidelines on information literacy relevant to the subject area?
  - Are there online or downloadable resources to assist students develop writing skills appropriate to the discipline and/or particular assessment task? This might include style guides which describe appropriate writing conventions.
  - For group projects, are there guidelines that could assist students to develop skills of collaboration and teamwork?
  - For presentations – including oral presentations – are there resources that would support students unfamiliar with this form of communication?

Feedback from staff: facilitating timely, explanatory feedback to students.



The importance of feedback to student learning is well recognised. Effective feedback:

- identifies what was done well, and explains why;
- identifies areas for improvement, with suggestions for how this might be achieved;
- is clearly aligned with the stated assessment criteria;
- is perceived, by the student, to be relevant to subsequent tasks or applications; and
- is timely – provided while the task remains 'fresh' in the student's mind.

While the role of peer feedback is receiving increased attention in higher education, teaching staff continue to play the prominent role in providing expert and constructive feedback. In large subjects, and for particular tasks, there may be numerous staff members involved, including sessional staff with more limited involvement in the subject overall. This poses additional challenges for ensuring consistency and for coordination.

Feedback is often an aspect of teaching with which students tend to be less satisfied. This can cause concern and frustration for teaching staff, as feedback typically occupies a large amount of staff time and effort, and becomes one of the most difficult aspects to manage as student numbers grow. Subject websites do not represent an absolute solution – rather, they can provide support for ensuring feedback is timely, accessible, and versatile.

Subject websites can be used to assist provide feedback from staff, and in a variety of ways. For example:

- Students have ready access to the information, avoiding the need to collect materials from specific places and/or at designated times;
- Learning management systems often include assesment tools which integrate assignment submission, online record of grades, and provision of written feedback, simplifying coordination for teaching staff;
- Where multiple assessors are involved, access to one another's responses to student work can help staff share ideas and also help ensure a consistent approach; and
- Written feedback can be enriched with links to relevant examples or learning resources.

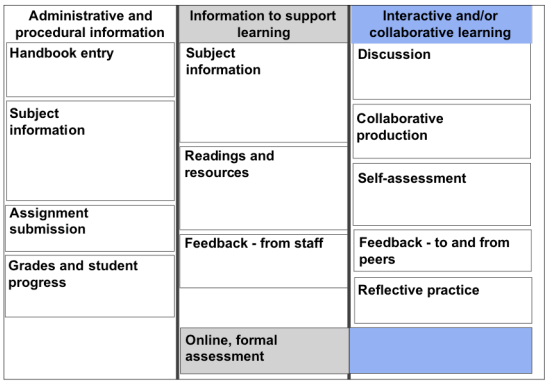
How might the subject website be used by staff to provide students with effective feedback on their learning?

- What tools are available for providing feedback to individual students?
  For example:
    - Is there a text box for online entry of comments?
    - Is it possible to add links to other parts of the subject website, to external sites, and/or to downloadable resources?
    - Is it possible to create a checklist, or 'rubric', for scoring? If so, is this appropriate for the particular assessment task?
    - Are there other, specialised tools available – i.e. purpose-built for the subject or subject area – which would assist in providing effective and efficient feedback?

Other possibilities

- If the task involves electronic document submission, is it desirable to provide specific annotations? If so, can the 'Comments' feature in standard word processing software be used?
- Are there benefits to providing both individual and collective feedback? If so, is it possible to link from an individual students' feedback comments, to further explanation or illustration elsewhere, in an area of the website accessible to the whole student group?
- For group projects, are there 'Group management' tools within the LMS that can facilitate providing comments to the group, rather than to individual group members? If so, is this appropriate for the particular assessment task?
- Would audio recording of feedback be preferable to written comments?

Online, formal assessment: enhancing formal assessment through the use of online technologies, as appropriate.



Formal assessment – that which contributes to students' overall grade for a subject – is a powerful driver of student learning. What is rewarded – or what students believe will be rewarded – determines the approach students take to their studies. The implications for teaching are twofold. First, this means that alignment of the assessment with the intended learning outcomes is critical. For example, students will not be encouraged to develop critical thinking skills if assessment is solely based on their ability to reproduce the information presented. Second, it is important that students understand the assessment criteria. Simply knowing the essay topic, for example, does little to ensure students present and evaluate the primary research literature rather than rely solely on review articles, textbooks, and Wikipedia.

This is as true for computer-based and online assessment as for assessment in any other format. The fundamental principles of effective assessment remain the same.

Online technologies do, however, provide opportunities to enhance assessment. For example, tests and quizzes may be enhanced through:

- Authentic, problem solving tasks.
  By enabling access to the range of online information sources and tools used in practice, the focus of test questions can be shifted away from an ability to recall specifics and detail, to an ability to identify, source and apply key information.
- Diversity of formats for the presentation of questions and problems.
  Video, high-quality images, audio or interactive media tools (e.g. simulations) can be used to overcome the typical constraints of relying on text and simple illustrations alone.
- Efficiency of grading and feedback.
  For some types of questions, grading and some forms of feedback can be automated.

Other types of formal assessment, such as assignments and group-based projects, can also be supported through online technologies. For example:

- Presentation of assessment products in digital format.
  Assessment tasks that involve the production of online and other digital products (e.g. video; still images; graphic design; calculations and computational models) can be supported by a subject website – not only in terms of online submission, but also as a means of displaying the product to students and staff involved in the subject.
- Providing tools for the management of peer-assessment.
  Peer assessment is increasingly being incorporated into university assessment, not only as a means of providing formative feedback, but also as a formally-assessed component of the learning in a subject. Online tools can prove valuable, particularly for managing allocation of reviews/reviewers and the confidentiality of the process (See also: *Feedback to and from peers*).

A note of caution. The most obvious assessment tools provided by a learning management system are those for generating quizzes, and these usually rely heavily on multiple-choice and other closed questions. Such quizzes have their uses (See also: *Self-assessment*), but the prominence of these tools can also divert attention from the more creative ways in which online techologies can enhance formal assessment practices.

How might online tools be used to provide enhanced forms of formal assessment?

Could tests be enhanced through enabling students access to computers?

For example

- Could the ability to search for online information enable a broader range of question types to be used? For example, questions that require students to synthesis and apply information. If so:
    - Would this better align with the intended learning outcomes for the subject?
- Could provision of onscreen images or video be used to enhance particular questions?
- Are there interactive tools or resources (e.g. digital simulations; tools to enable complex calculations) which could usefully be incorporated into test design? If so:
    - Should the range of resources available to students be specified or restricted? If using online resources, how might this be achieved?

Can digital technology and the subject website assist students to better present their ideas?

- Would assessment be enhanced if students were able to use digital tools to present ideas and/or demonstrate knowledge and skills? If so:
    - What tools would be appropriate for the particular subject or task?
    - Could this support the use of more 'authentic' assessment tasks?
- Is there benefit in enabling students to display and share their completed work via the subject website?

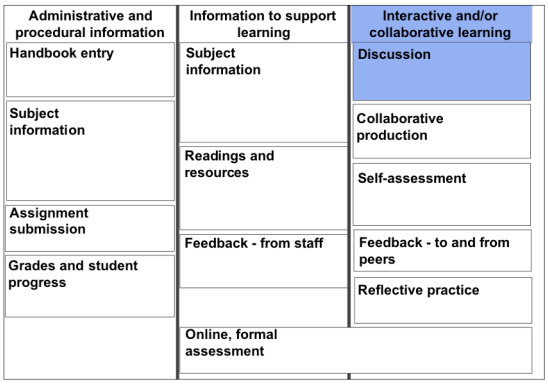
Is there a role for the subject website in encouraging student collaboration in assessment?

- If collaborative projects form part of the assessment, how might the subject website be used to assist group members share information and ideas? (See also: *Collaborative production*)
- Is there a role for peer assessment? If so, how might the subject website be used to facilitate this? (See also*: Feedback to and from peers*)

How might issues around the authenticity of students' work be managed?

- For 'high-stakes' assessment tasks, where ensuring authenticity is of concern, how might this be managed when assessment is online? For example:
    - Is there a need for the assessment to be invigilated in the style of more traditional paper-based examinations?
    - Could timed-release of questions online suffice?
    - Could design of the task itself remove the need for other measures?

Discussion: facilitating collaborative learning through discussion and debate among students, and between students and staff.



Discussion and debate is a traditional feature of university education in Australia. In some disciplines, such as many in the Arts, discussion and oral critique plays a central role in the teaching while in many other subject areas it forms part of the mix of learning activities. For example, it is common for tutorials or small group tasks to be designed as a forum for discussion and interaction between students, and between students and staff. Adapting to this aspect of university in Australia is one of the challenges faced by international students coming from systems with very different traditions.

The current educational environment places increased emphasis on student interaction, discussion and debate. First, constructivist theories of learning are widely accepted – the importance of students' 'active engagement in order to construct their own knowledge' is espoused in most academic development texts and forums, and embedded in many university policies. Students are encouraged to engage in dialogue, contribute ideas and work collaboratively. Second, generic skills are being given greater priority in university education – and students' development of generic skills such as 'oral communication', 'interpersonal skills', and 'teamwork' benefits from practice in discussion and debate. Equally importantly, engaging in critical discussion and debate helps students develop their skills in critical thinking.

Online discussion might be incorporated into subject design in order to:

- Assist staff and students communicate from a distance;
- Enable discussion to extend beyond the allotted class time;
- Involve people from outside the subject group;
- Provide an alternative form of communication to in-class, verbal discussion – whether simply to provide variety in the subject, to meet the different needs and preferences of individuals, or to allow students time to reflect on the debate and consider their response before contributing;
- Develop students' skills in using online communication tools; and/or
- Respond to students' widespread and increasing use of online communication in other aspects of their lives.

The above list refers to 'why' online discussion might be used. To decide 'how' requires consideration of the particular learning objectives and the relationship between online discussion and other learning activities. Depending upon the purpose, online discussion might:

- Extend discussions commenced in class, or be based on different topics;
- Be triggered/led by either staff or students;
- Involve synchronous or asynchronous tools, and might involve text only, or include video, audio, and/or other tools such as screen sharing (See also: *Collaborative production*);
- Be more or less structured; and
- Involve mandatory or optional participation.

Postgraduate students may particularly value online discussion. At many institutions, postgraduates are the student group most likely to be studying part-time or off-campus. Also, postgraduates have more experience of higher education and so are more likely to have the level of confidence necessary to actively engage with extended discussion and debate, and the interest to pursue ideas beyond the 'boundaries' of the subject itself.

Is there benefit to enabling and encouraging online discussion, and how might it be used?

What areas of the subject might be supported by online discussion?

- Are there particular learning activites that could be supported by online discussion? (e.g. problem-based learning; role play; case study discussion; group projects)?
- If group projects are used:
    - Would student groups find online discussion areas more useful than email alone?
    - Does access need to be restricted (e.g. group members only; group members and staff)?
- Do individual students often ask questions after class? If so:
    - Would there be value for the class as a whole if staff (or nominated students) posted responses to some of these questions online?
    - Could such responses be used to encourage further online discussion among students?
- Could online discussion be used to encourage students to explore additional topics, related to subject content, but not otherwise covered in class? For example:
    - Topical issues from the Australian press;
    - Examples of discoveries/events/practices from other countries;
    - Recent research findings;
    - Perspectives/approaches drawn from other disciplines; or
    - Particular ethical issues.
- Could online discussion provide a means of supporting students in assessment tasks? For example:
    - Students post questions (e.g. regarding criteria, process or strategies);
    - Students post ideas and suggestions in response to questions posed by staff or students (e.g. suggested research strategies; useful resources or information discovered); and
    - Staff post ideas and suggestions in response to questions posed online or elsewhere.

Could online discussion be used to meet students' particular needs?

- Are students enrolled from a distance or unable to attend to classes for other reasons?
- Is there likely to be a group of students who are more able and/or comfortable communicating their ideas online?
- Are there groups of students with shared special interests, related to the subject but not necessarily of interest to the entire student cohort, who would benefit from an online discussion forum on this topic?

What might motivate students to participate?

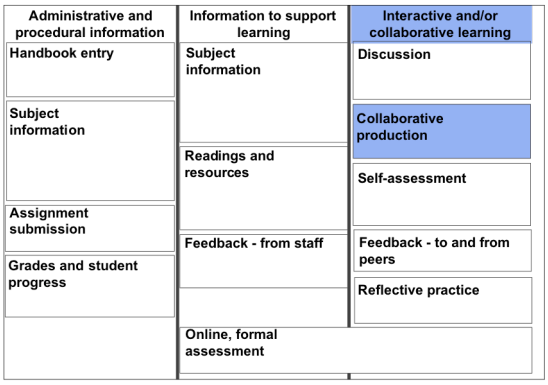
- Is participation in the online discussion expected of all students? If so:
    - Is this expectation, and the reasons for it, clearly explained to all students? (See also: *Subject information* in *Information to support learning*)
    - Has the time required for participation been taken into account?
    - Is there benefit to rewarding participation through formal assessment?

What facilitation is required?

- Would the online discussion benefit from active facilitation* and/or leadership? If so, who would take on this role (e.g. staff; nominated students)?

* There are various resources and guides available on how to effectively facilitate online discussion.

Collaborative production: facilitating collaborative learning through group projects and production.



The trend toward more collaborative learning in universities is evident in the rise of group projects as a component of both undergraduate and postgraduate subjects. Most commonly, such projects involve small groups of students working together over extended periods of time – including out-of-class time – to develop some form of 'product' which is ultimately assessed.

There are many reasons for this interest in group projects, including:

- Recognition of the role of group projects in developing students' 'generic' skills, particularly teamwork skills, but also communication and interpersonal skills;
- The specific nature of some disciplines being dependent upon effective teamwork and the specialised contributions of different team members (e.g. drama production);
- Managing increased class sizes, with limited resources for assessment;
- Recognition of the valuable contribution peer learning can make; and
- As a means of encouraging collaborative study between students, more generally (e.g. to support students' transition to university study).

There are also recognised challenges associated with group projects, the most significant concerning communication and assessment:

- Communication between group members

  As most projects require collaboration outside class, issues of coordination and communication typically present students with significant challenges. There is some potential for the subject website to be used to support communication (See also: *Discussion*) and collaborative production between group members.

- Assessment of group projects

  This is perhaps the most contentious aspect of group projects. However, as subject websites provide no particular solutions (beyond those described under *Online, formal assessment*), and as designing assessment for group projects is a topic well addressed by other resources*, this is not covered here.

While of little direct relevance to the design of subject websites, it should be noted that collaborative production – and the role of technology in supporting this – is an area receiving attention well beyond university teaching (e.g. Web 2.0 technologies). Researchers are increasingly encouraged to work collaboratively, and technology is being developed to support major projects of this type. And the broader community is already involved in extensive collaborative production – if under different names – by virtue of online, information sharing projects and resources, the most well known being Wikipedia. The very nature of knowledge creation and knowledge 'ownership' is changing, and it may be that the ways and extent to which university students collaborate may also change significantly in the near future.

* See also:
Assessing Learning in Australian Universities:
http://www.cshe.unimelb.edu.au/assessinglearning/03/group.html
Enhancing Assessment in the Biological Sciences:
http://www.bioassess.edu.au/bioassess/go/home/pid/25

If students are required to collaborate in order to produce a piece of work, are there possibilities to support this through the subject website?

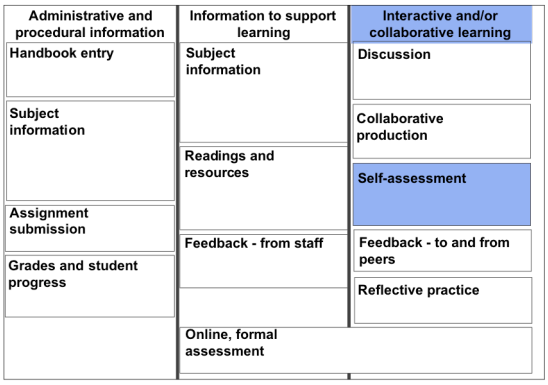
- Is there benefit in providing online storage space for electronic files? If so:
    - How will version control be managed?
    - Is there need for a record of changes?
    - Who has access to these files?
    - Is back up of files the responsibility of students, or is it managed by the system?

- Are students creating websites? If so:
    - What mechanism will be used to publish the sites, and can the sites then be accessed through the subject website?
    - Can this be supported by content management systems (ie. systems that provide a browser interface for ready editing and additions)?

- Is there a need for access to specialist software? If so:
    - Can this be provided through the subject website, to ensure all students ready access?
    - And if the software is external to the university system (e.g. YouTube), can access be restricted to protect students' personal information?

- How are students provided with guidance on how they might use the system?

Self-assessment: providing opportunities for students to self-assess their knowledge and to test ideas through the use of interactive tools.



One of the earliest applications of computers in education was to provide interactive programs to help convey particular concepts. Typically, students were required to move through a series of activities, answering questions along the way. In many subject areas – particularly in the sciences – such 'computer-assisted-learning' (CAL) programs continue to provide valuable tools, enabling students to test their knowledge and understanding.

Among the features of many learning management systems are the inbuilt tools for creating tests and quizzes. In many ways, these tools make the creation of CAL-type programs simple, removing the need for staff to master complex programming software and so encouraging and facilitating the use of online question-answer approaches to self-assessment.

Effective interactive tools for self-assessment are usually more than questions and answers, however. They often take advantage of the digital medium to provide access to information, such as high-quality images or databases, or the ability to manipulate material in order to help students understand and address the questions posed.

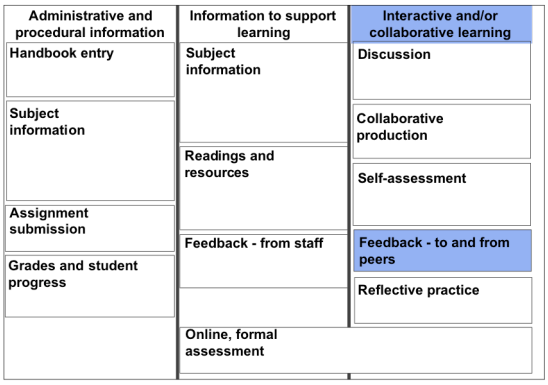
Due to the now-extensive history of CAL development, there are many publicly accessible, online tutorials that address particular ideas or concepts.

Another form of interactive self-assessment is represented by the various tools which enable students to test formulae, make computations, manipulate information, or perform other such calculations.

Are there interactive tools that students can use to test their knowledge and ideas?

- Are there concepts or types of information that could be supported by online self-assessment? If so:
    - Are pre-existing programs available, and could these be accessed via the subject website? If not:
        - Is there benefit in creating specific 'quizzes' using LMS tools?
    - How are students encouraged to use these (e.g. as preparation for class; for revision; to focus on problem areas, as identified through formal assessment)?
- For quiz-based tools, what types of questions are appropriate? For example:
    - Multiple choice
    - True-false
    - Single word or phrase responses
    - Identification of parts (e.g. matching labels to parts of an image)
    - Manipulation of parameters
- What type of feedback should interactive tools provide? For example:
    - A total score (i.e. number of correct responses)
    - Identification of correct and incorrect responses
    - An answer to a calculation or response to a manipulation
    - Explanation of why a particular response is correct
    - Explanation of why a particular response is incorrect
    - Links to further questions on the same topic
    - Links to reading or other resources related to the particular topic

Feedback to and from peers: providing structured opportunities for students to review and comment on one another's work.



There are recognised benefits to involving students in providing feedback on one another's work. These benefits include:

- Encouraging students to consider the specific assessment criteria and standards, and how these are applied, in order to review and improve their own work;
- The provision of more feedback to students than is possible if relying on staff feedback alone;
- Illustration of the diversity of perspectives through students receiving a variety of feedback;
- Learning different ways of approaching a problem by looking carefully at the ways other students addressed the issue; and
- Providing incentive for students to produce high quality work (ie. students are often more concerned about the perceptions of their peers than those of teaching staff).

Like group work, the effective design of peer assessment* requires careful consideration and planning, and is not dependent upon subject websites. One area in which technology can provide assistance, however, is in the coordination and management of peer review programs.

* See also:
Enhancing Assessment in the Biological Sciences:
http://www.bioassess.edu.au/bioassess/go/home/pid/27

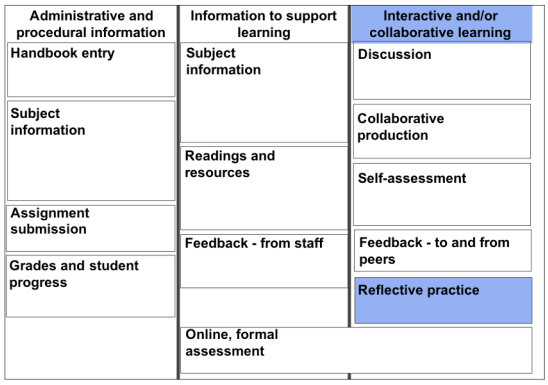
How can the technologies be used to encourage and support peer review?

Is there benefit to including peer review and feedback as part of the subject design?

If so:

- Are there tools available for managing the allocation of reviewers, handling of reviews, and recording activity?
- Could such tools be accessed through the subject website?
- How is the purpose of peer review explained to students? (See also: *Subject information* in *Information to support learning*)

Reflective practice: developing learning skills and self-awareness through reflection on learning.



The importance of reflection to effective learning is widely recognised. For students, reflection involves the review of previous work or activities in light of feedback and self-assessment. While it is sometimes assumed that students will automatically use feedback in this way, there is a growing trend toward explicitly encouraging reflective practice in higher education in Australia. This trend emerges not only from the learning objectives of particular subjects, but also from the growing interest in student portfolios – documentation which spans the course of students' university studies, and beyond.

In some university subjects it is standard practice for students to maintain written reflections on their learning. Such 'learning journals' include more than a list of what students did during the course of a subject. They require students to consider why they took certain actions or approaches, what the outcomes were, what feedback they received, and what this means for them in terms of their own understanding and future practices. Education is one field that has long made use of reflective journals, as have some other disciplines in the Arts and Humanities.

Whether confined to particular subjects or broader in scope, portfolios and reflective journals can provide:

- A structured space for students to describe and illustrate their learning;
- Encouragement for students to 'map' their learning to particular objectives;
- A record which can be directly assessed, or which students can draw upon for other assessment tasks; and
- A mechanism to develop students' awareness of their learning, whether for the purposes of explaining their skills to future employers or to identify areas for further development.

Subject websites can be used to encourage and support reflective practice, most notably through the use of 'e-portfolios'.

How can the technologies be used to encourage and support reflective practice?

- Does the subject involve activities upon which student learning could be enhanced through structured reflection? For example:
    - Industry or professional placements;
    - Clinical practice;
    - Peer review;
    - Substantive group projects;
    - Performance (e.g. performing arts);
    - Role plays (e.g. counseling or consulting); or
    - Major research projects (e.g. postgraduate research training)

  If so:
    - Is there benefit to creating a structured approach to the task, or is it more appropriate to leave this to individual preference?
    - Is the preparation of a written reflection a discrete activity, or part of an ongoing process of portfolio creation?
    - Are there particular tools within the learning management system that could be useful, or is providing students with online storage sufficient?
    - Will any of the work be assessed? If so, by what criteria?
    - Will students be encouraged to make their work accessible to others (e.g. students in the subject; staff; others)?

- Is engagement in this task expected of all students? If so:
    - Is this expectation, and the reasons for it, clearly explained to all students? (See also: *Subject information* in *Information to support learning*)
    - Has the time required for participation been taken into account?

Part 3: Institution-level decisions

Identifying 'core' elements

Mandating the inclusion of specific elements in all subject websites helps to ensure that students recognise the role of subject websites in their course and, as a result, treat these as a primary source of current subject information. This provides clarity for students, and an efficient and effective means of subject-based communication for teaching staff.

The particular elements identified as core may differ between courses and between institutions.

Figure 3.1 provides an example of one university's approach to determining a minimal level of online presence for all subjects.

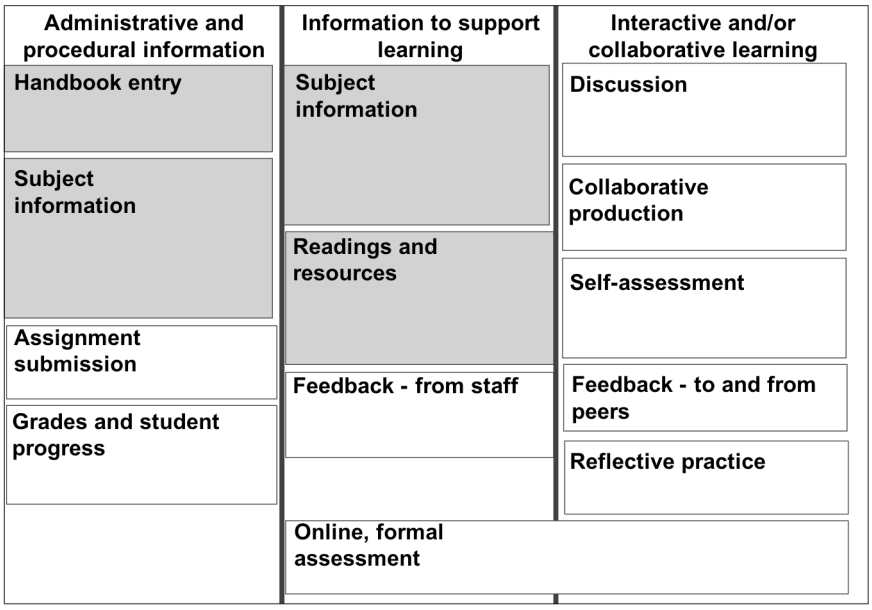


Figure 3.1 An example of one university's approach to determining a minimal level of subject presence: the core elements for inclusion in all undergraduate subjects at the University of Melbourne, from 2008 (see Academic Board meeting minutes, September 2007)
Shading = core elements; White = inclusion optional, with the expectation that many subjects, including all University Breadth subjects, will include some of these elements, as appropriate.

A consistent approach to the naming and/or location of core elements of subject websites can potentially be of further benefit, enabling students to readily navigate to the core information for each of their subjects. Depending upon course structures, the merit of such consistency may involve decisions at the level of school, faculty or institution. For example, if students are likely to be enrolled in subjects provided by different schools or faculties, an institution-wide approach may be desirable.

Determining levels of access

Despite a global trend toward increasing 'open access' to information of all types, most university subject websites remain available only to enrolled students and specified staff. This is due in part to copyright and intellectual property considerations, but also in large part to technical legacies and established patterns of practice. Reviewing and, as appropriate, modifying levels of access therefore requires action on the part of institutions and individuals.

Public access

Increasingly, universities are enabling public access to all or parts of subject websites. The motivations for this include:

- Knowledge transfer, by providing access to subject-based resources and teaching;
- Promotion of institutions and courses, by providing more information to potential students; and
- Collaboration with other institutions, enabling the sharing of subject materials and information.

However, whether for technical, legislative or philosophical reasons, many institutions will consider a move to 'open access' as inappropriate for subject websites.

Broadening access within the institution

There is a strong case for some broadening of access beyond the immediate subject group of enrolled students and staff. Enabling access for the broader university community – for example, all staff and enrolled students – offers an opportunity to:

- Help students to make informed subject choices when course planning by providing access to more information about the teaching in individual subjects;
- Assist with coordination of the teaching when subjects are taught by teams of staff, particularly in large subjects involving many sessional staff; and
- Support course-wide planning and coordination by providing insight into the teaching of all relevant subjects for course coordinators, and for staff coordinating and teaching individual subjects.

Specifying levels of access for particular elements

It is appropriate to consider different levels of access for particular parts of a subject website. For example, the two *Subject information* elements in the *LMS Framework* are obvious candidates for broader access. An argument can also be made for providing access to *Readings and resources*, at least to the broader university community. It might be appropriate, however, to restrict access to individuals' contributions (e.g. *Discussion*) to enrolled students and specified staff. And there is clearly a need to further restrict access to some administrative information – most especially grades and other records for identified students.

Figure 3.2 provides an example of the differing levels of access recommended for subjects at the University of Melbourne. In making this recommendation, however, the University acknowledged that there was first a need for a technical solution to be found which would enable different LMS elements to be readily modified by subject coordinators. As at Feb 2008, access to sites through the central LMS remained largely restricted to enrolled students and designated staff.

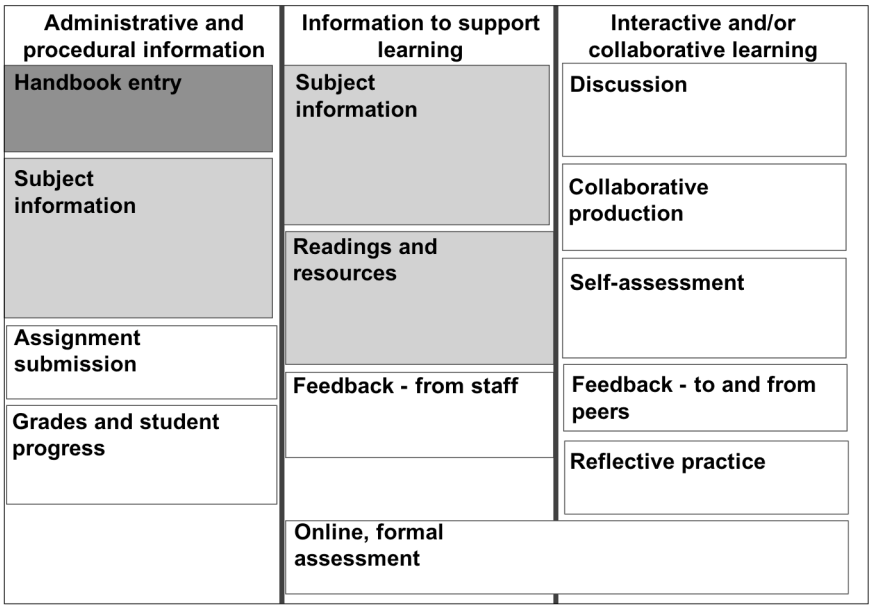


Figure 3.2 An example of one university's approach to describing desirable levels of access: recommended levels of access at the University of Melbourne (see Academic Board meeting minutes, September 2007)

Dark shading = publicly accessible information; Light shading = available to all University staff and students (once a technical solution becomes available); White = accessible only to students enrolled in the subject and designated staff.

Appendix 1

Various information systems contribute to subject websites

The terms 'subject website' and LMS are often used interchangeably. While this is not always a problem, in policy and technical discussions it can be. Different interpretations can lead to confusion and misunderstandings. Therefore, it is helpful to clarify the relationship between the online presence for subjects and the relevant information systems of the particular university context.

As an example, Figure A.1 illustrates the systems that contribute to the creation of subject websites at the University of Melbourne (based on systems in place November 2007).

> Learning Management System (LMS) is applied here in its broadest sense. It refers, collectively, to the various centrally supported systems that provide subject-based online support.
>
> *Blackboard* plays a key role, forming the central platform of the University's LMS. It provides the entry point to integrated learning technologies within the LMS, such as *Lectopia*, *Neo*, *Respondus, Turnitin* and *Readings Online*. Some of these can link, in turn, to associated systems such as *Sakai*, which is also included within the definition of the University's LMS.
>
> Subject sites originate in the LMS, and in *Blackboard* specifically. However, they may then link into other LMS elements, and/or into other 'local innovations' within the University, and to externally-located tools and resources.
>
> Subject sites in the LMS also link to other University systems, such as the online handbook and the student portal.

In selecting which systems and tools to incorporate into subject design, there are several key considerations:

- Movement between different areas and tools should be as seamless as possible from the point of view of the student.
- Tools and features should serve the intended purpose.
- The system should be stable and, as far as possible, supported at a technical level.

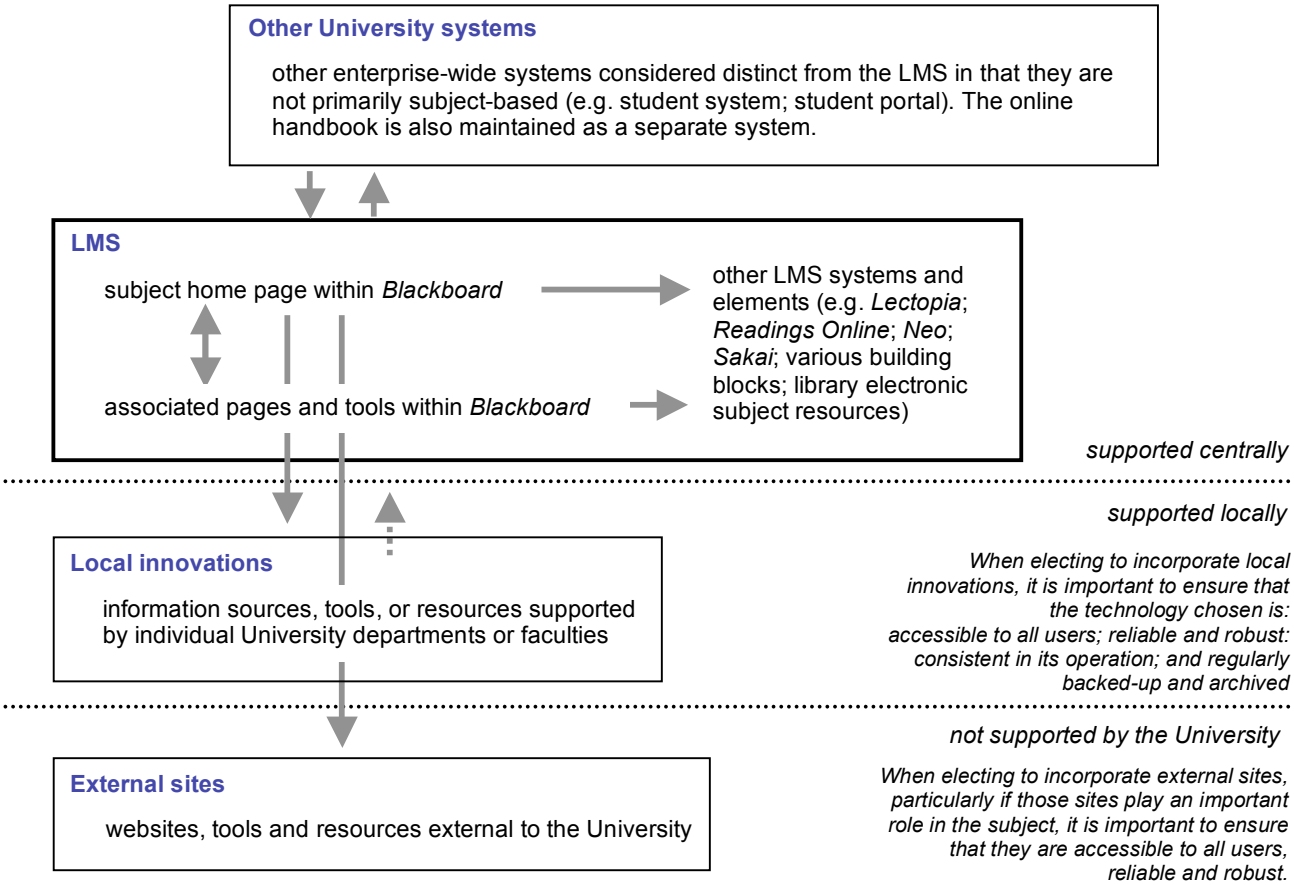


Figure A.1: Systems and sites that may contribute to a subject website (The University of Melbourne, Nov 2007)