

The



*Technology Enhanced Learning
in Research-led Institutions*

Project

Supporting high level learning through research-based methods and e-learning

Guidelines for course design

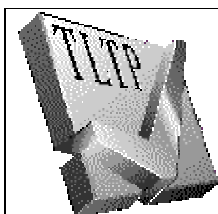
By Mick Roach, Paul Blackmore & Jay Dempster

The TELRI Project

Centre for Academic Practice
University of Warwick
Coventry CV4 7AL

Email: telri@warwick.ac.uk

Web site: www.telri.ac.uk



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Supporting high level learning through research-based methods: Interim guidelines for course design

Mick Roach, Paul Blackmore & Jay Dempster

TELRI Project
Centre for Academic Practice
University of Warwick

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INTRODUCTION

Through the work of the TELRI Project, we have been exploring the relationship between research and learning. We believe that good researchers possess capabilities that undergraduates also need if they are to fulfil their learning potential. In these guidelines, we suggest how courses and assignments may be designed to develop higher order learning processes, which we have termed "research capabilities". The approaches described arise from an educational framework that is of value to learning, research and professional development.

There is wide agreement in higher education that gaining a degree means more than mastering subject content. Cognitive skills and subject-specific skills are increasingly emphasised, in the belief that they are transferable to other situations, and course and module descriptions are starting to reflect this. However, it is not easy to produce courses that, through their processes and methods of assessment, truly develop some of the most valuable skills. Whilst recognising the highly politicised debate about supposed links between research and teaching (Elton, 1986; Reich, Rosch & Catania, 1988; Ramsden & Moses, 1992; Hattie & Marsh, 1996; Roach, Blackmore & Dempster, 2000b), it is widely accepted that the construction of new knowledge and understanding is inherently a part of research. We therefore believe that a fruitful area to explore is that of the *processes* which research and student learning may have in common (Larsson, 1987; Feldman, 1987; Brew & Boud, 1995). We suggest that many research processes are good learning processes that have a more general application (Roach, Blackmore & Dempster, 2000a). If that is so, then the more institutions can encourage their undergraduates to think and work like researchers the better. At present the potential benefit of lecturers' research or professional expertise for teaching and learning approaches is not always exploited fully, and this will only change if a conscious effort is made that it should do so.

These guidelines aim to assist academic staff and course developers in the design or review of courses or modules. The educational framework outlined provides a means of:

- making powerful and robust decisions and justification for teaching, learning and assessment methods and use of resources;
- enabling more explicit statements to be made concerning student learning outcomes;
- establishing coherence in content, structure, methods of delivery, assessment, student progression, support and guidance;
- suggesting ways of revising course processes and assignments to enhance learning and course quality.

The team believes that designing and assessing courses in ways that emphasise adaptive learning enhances the **quality** of courses. These course design approaches are easily extended to the learning processes and assignment practices across a broad range of educational settings, particularly in professional development training, but also in schools and further education.

NOTE

These are interim guidelines produced through the first phase of work within the Universities of Warwick and Oxford. Institutions may use their own versions of these and a revised version of the guidelines, adapted in the light of feedback in phase 2 work with Birmingham, Durham and Southampton, which reflects some of the institutional variations, will be published in the later stages of the Project.

PART 1: TELRI – An educational framework for course design

Defining research capabilities

The TELRI Project has focused on the cognitive skills of researchers, defined some of them, and suggested how they can be developed and assessed. The educational framework described here is intended to provide a general insight into some of the dynamics of learning observed and experienced by academics and students in higher level learning. They reflect and extend established educational theories of learning and effective teaching and learning practices.

At the heart of contemporary discussion on transferable skills is a wish to identify capabilities that have a wide application and to develop them through the curriculum. Cognitive skills are particularly important in enabling the transfer of capability from one situation to another, both because they are less context-dependent than some other human abilities often referred to as skills, and because they can themselves aid transfer. There would be wide agreement that they are transferable, at least within a discipline.

Research activity by its nature provides opportunities for innovation that develop higher cognitive capabilities and foster creativity. We have termed these “research capabilities”. We argue that course design should aim at the development of those higher order learning processes. Apart from the obvious benefits, it is believed that research-orientated learning is likely to develop students’ abilities to transfer their learning processes into new situations, so that they can develop as experts rather than as competent practitioner.

We draw a distinction between competence and expertise by highlighting two learning processes that we believe to be complementary and mutually supportive. The first is essentially a reproductive process and is appropriate after a situation has been defined, which we have termed “**adoptive learning**”. It requires the application of well-understood knowledge and the mastery of tools, techniques and procedures in bounded situations. Adoptive learning can produce immediately impressive results but may be less transferable to other, less familiar situations. The second makes use of higher order thinking in more open situations, which requires and develops higher cognitive processes and is inherently a creative, generative and reflective process. We have termed this “**adaptive learning**”. (You may have come across these terms used differently elsewhere; we ask you to accept our usage for convenience in the distinctions in learning processes we aim to make.)

Individuals whose professions require the rigorous application of a discipline, such as researchers, are highly effective in adaptive learning and are potentially well placed both to assist others in developing similar expertise and to assess the presence of such capabilities in others. These guidelines therefore aim to assist academic staff and course developers in designing effective courses and enhancing existing course quality, to benefit students in their learning both at university and beyond.

Principles of the framework

The educational framework suggests ways of supporting and assessing adaptive learning. Although the general ideas and descriptions of the learning issues discussed will be familiar to academics, some terms may have more familiar descriptions in a particular discipline.

The framework proposes that:

- One of the primary purposes of a degree course at a research-led university is to assist in the **development of students' expertise in a subject discipline**. This provides the students with the intellectual skills to perform effectively when presented with a wide range of problems in continually changing environments, albeit with a discipline-related perspective.
- The **purpose of a course** (and thus its nature) is influenced by the *assessment criteria* while the **quality of a course** is determined by the *support offered* to students in working to attain those criteria.
- **Students' study approaches are significantly influenced by the perceived purpose of the course**. The extent to which the course aims to develop adaptive (or adoptive) learning processes should be reflected not only in the rhetoric of the aims, objectives or learning outcomes, but also as importantly in the teaching, learning and assessment methods actually used. Students' perceptions of the purpose of a course will significantly influence the way they engage intellectually with course activities (e.g. an active or passive approach to lectures or resource-based learning).
- The quality of the learning process is largely determined by the nature of the assignment task, particularly the extent to which its components are unfamiliar to the student.
- **Adoptive methods establish adoptive processes while adaptive methods develop adaptive and creative processes or approaches**. The development of lower level learning processes, such as following set methods or recalling facts, is not a foundation for the later development of higher order learning processes such as reasoning, analysis or creativity. The capabilities required are different in nature. At any level of study, adaptive learning processes can and should be encouraged to develop alongside adoptive learning.

Terminology

The team were cautious of introducing the novel terms “adaptive” and “adoptive” but could find no existing terms that precisely expressed the difference described above. There is of course a superficial resemblance between these terms and “deep” and “surface” approaches to learning, on which there is a substantial literature (Marton and Saljo, 1976; Ramsden, 1992). The terms “deep” and “surface” have proved to be immensely useful in analysing learning approaches, and seem to be widely generalisable (Boud, 1988). There are some disadvantages in using them in the context of TELRI, however.

While both of the categories termed adoptive and adaptive exhibit the familiar deep and surface learning aspects, the distinction between deep adoptive and deep adaptive (as shown in Table 1) has proved useful in identifying, supporting and encouraging high level learning across the disciplines. A more detailed exploration of these ideas can be found in Roach, Blackmore & Dempster (2000).

	Deep*	Surface*
<p>ADAPTIVE</p> <p>Generation of form Open situations Extending and applying knowledge and techniques to novel situations Developing understanding, reasoning and insight Transfer of capabilities</p>	<p>Highly developed reasoning Deep understanding, insight and creativity formed High degree of conceptualisation</p>	<p>Developed general ideas and vague approaches Developed a narrow focus</p>
<p>ADOPTIVE</p> <p>Following and recognising form Bounded situations Following established knowledge, techniques and strategies</p>	<p>Knowledge and techniques developed to a high degree Complex strategies followed</p>	<p>Developed a superficial breadth of knowledge Poor strategies, focused on discrete elements without integration</p>

Table 1: Identifying commonality in terminology of forms of learning
(*adapted from Ramsden, 1992)

The distinction may be drawn by considering the case of a very high quality training course in, for example, how to produce a drawing with a computer-aided design package. This would not necessarily be surface learning, since the learner might have a self-chosen task in mind or an "internal" motivation, which could lend purpose and depth to the learning. The learner would be highly likely to relate the learning to previous learning, perhaps of other design software, and examine the logic of the package rather than simply to internalise sequences of key presses. None of this sounds like surface learning, yet it would be adoptive learning, since the situation is bounded and the knowledge and techniques required would be well established.

Distinguishing Higher Order Learning Processes

The two forms of learning outlined, adoptive and adaptive, are prompted by different assignment tasks and have different assessment criteria. It is suggested that adoptive learning is a widely practised form of learning and actively taught, while adaptive learning using higher order thinking is a development process, which is personally undertaken by each student. As the criteria for identifying higher level learning or "expertise" are complex and often require judgements that are not readily reduced to simple rules, adaptive learning, in many cases, may only be determinable by a professional expert. A form of categorisation of the cognitive processes involved in each of these two forms of learning is offered in Table 2.

The two forms of learning assist in the distinction between those skills and abilities, which *may* be applied in various contexts, and the 'capabilities to transfer', which assist in the recognition of those aspects of unfamiliar contexts that allow such skills to be applied appropriately. High achievement in adaptive learning rather than adoptive learning forms the basis of expertise. The extent to which the development of adaptive capabilities is balanced against adoptive learning outcomes is likely to determine a student's ability to respond effectively to undefined and unfamiliar situations within and beyond the discipline context. We would suggest that adaptive learning encapsulates some of the capabilities that employers are increasingly seeking to obtain from university graduates.

ADOPTIVE LEARNING	ADAPTIVE LEARNING
Knowledge and Practice of....	Formation and Generation of....
Facts, Assertions, Rules and Laws	Personal Interpretation and Meaning
Terminology, Language and Protocols	Evaluation and Decisions
Techniques and Procedures	Arguments, Reasoning and Justification
Organisation and Structure	Synthesis and Conceptualisation
Established Principles and Relationships	Originality, Creativity and Innovation

Table 2: Two Distinct Forms of Learning

Motivating Students to use Higher Order Thinking

There is a natural propensity to use previously formed concepts before developing new ones. It must be appreciated, therefore, that students will try to use the least amount of effort and intellectual energy to complete assignments. This can lead to strategic learning, that is, they fall back on adoptive learning approaches. The development of strategies that can be used for a series of assignments demonstrates the students' ability to recognise a common form in such assignments, even deep and complex problems or issues. This is sometimes displayed by surface or superficial problem based learning courses (Boud, 1988). It is not being implied that this form of learning (or indeed either learning form, adoptive or adaptive) is inherently a degenerate form of learning. The point is that if the form of assignments is familiar, then the students do not need to use higher order thinking. The emphasis for adaptive learning is that the form of assignment, and therefore response, is not explicit and familiar. It is then that the student has to use adaptive learning, i.e. create structure where there is none apparent. For this reason, the motivation to make use of higher order thinking skills is greatly influenced by the familiarity of the assignment scenario and will determine the type of intellectual processes engaged in by the student. In order to engage students in higher level learning, assignments must therefore provide novel and open scenarios that require new ways of looking at a concept or new concepts to form in the students' minds. Within course assignments, students' own perceptions, interpretations and ideas would require supportive evidence and be clearly argued and justified. This indeed is the nature of research.

However, many students are unsure or unaware which skills and abilities are called for, and valued in assignments. Assessment methods, marking systems and feedback to students should make transparent the criteria for assessing and rewarding the level of achievement of specific learning outcomes. For example, in an assignment based upon an essay format of "discuss" or "compare", the grade may be weighted to reflect the importance of a student's own ideas, or reasoning skills, presentation of established subject knowledge or ability to undertake specific techniques. When learning outcomes are provided, such as "the ability to develop an argument" are used, the students benefit from some explanation or example of what this means and can more easily adopt study approaches that develop the appropriate learning processes required and thus attract good marks.

Designing Assignments to Assess Adaptive Learning Capabilities

In assessment practice, it is useful to explore ways of differentiating between well-presented expression of established knowledge and methods and the kind of subject understanding, appreciation and reasoning demonstrated by an 'expert'. In this way, the identification and assessment of adaptive learning can be based upon the intended aims of the course and the academic ability of the course tutor, as "expert". If assessment is designed for adoptive learning, students will tend to use and develop adoptive learning processes, while if it is designed for adaptive learning students will use and develop higher cognitive processes (to the best of their ability). The course design can be enhanced, therefore, by balancing the adoptive and adaptive components of the assessment such that it reflects the overall intended nature of the course.

Course assignments can be used as part of the learning support in general as well as for assessing the extent to which a student has developed particular capabilities (Table 2). In terms of developing adaptive learning or assessing the extent to which a student has developed expertise, four basic questions act as a guide:

1. Will the assignment task enable expertise to be demonstrated?
2. Does the task allow students fully to demonstrate their level of expertise?
3. Are students in a position to judge the quality of their work before it is assessed?
4. Could students complete the assignment successfully through purely adoptive learning?

Although academic experts are often intuitively aware of appropriate assignments for determining the students' level of expertise, some generic guidance is suggested below that may assist in making more explicit statements about the assessment process. Assignments that assess expertise have the following characteristics (among others for each discipline):

- **There is no unique, established solution or correct response.** Assignments tend to be open, novel and discursive in nature and form (at least for the students) with no fixed approach.
- **No purely procedural, 'algorithmic' or learned response will suffice.** The assignment thus requires modelling such that the student must bring unidentified structure to a problem.
- **Judgements of value, likelihood and probability are required.** These require the development of a view, perspective or approach and a coherent trend of reasoning with supportive evidence.
- **Originality, innovation, creativity, insight, personal interpretation, contemplation and reflection** are required. This requires qualitative, descriptive, information-rich approaches based on a broad remit.
- **Tasks are concerned primarily with the conceptualisation of the subject** as opposed to the substantive knowledge and techniques content of the subject.
- **Scope within the task for creative input** is provided so that the students can demonstrate fully their level of expertise.

The interpretations of these generic descriptions will clearly be subject-specific, but the basic learning outcomes (Table 2) are surprisingly subject-independent. This cross-discipline commonality is a reflection of the transferability of a student's ability to create form from information, situations and knowledge.

Supporting Adaptive Learning in Courses

Adaptive learning requires students to engage in novel scenarios within and beyond the discipline context. While the *purpose* of a course, and thus its *nature*, rests with the course assignments, the *quality* of a course is determined to a large degree by the support provided for students to undertake those assignments and attain the desired learning outcomes. Explicit statements of learning outcomes do not inherently give the student an insight into the learning processes required. Teaching, learning and assignment support can be designed to make more transparent those learning processes that are most effective in achieving, or working towards, the intended learning outcomes.

To support this, the course should aim to provide students with opportunities for obtaining feedback on their ideas and their approaches through debate and discussion and sharing of work, as well as providing an environment for reflection. Extending this to peer assessment, students can learn valuable lessons when given access to the work of their peers by engaging in the evaluation of what is and what is not good quality work in their subject area, using the same open-ended approaches the tutor might use.

The emphasis of the course design thus needs to be placed firmly on supporting the activities of the students and highlighting the capabilities to be developed rather than centring on the subject content of the course. Specific learning outcomes can only be developed and assessed by offering the students the opportunity to undertake specific and appropriate learning activities. The requirement in research-led teaching is to provide assignments and activities that allow the demonstration of the adaptive learning capabilities and qualities in a student's work. By nature, such assignments tend to be more open, challenging and motivating than those that require the demonstration of established knowledge and procedures, characterised by adoptive learning outcomes (Ramsden, 1991). By offering such designed activities early in the course, the students are not only made aware of the course module expectations, but also supported in developing the required capabilities and making appropriate use of the learning resources, guidance, feedback and opportunities for reflection provided. In turn, students themselves can contribute to the course, bringing in resources that support the formation and expression of their ideas and justifying these. In general, the nature and effectiveness of the course support can influence the students' learning experience, and more importantly, can determine the overall quality of the course.

Technology Enhanced Learning

There has been much written on the subject of how information and communications technologies (ICT) can best support educational processes (Laurillard, 1993; Ellington, Percival & Race, 1993); French et al, 1999; Fry et al, 1999; McConnell, 2000). Often, ICT approaches are illustrated that replace or support various types of teaching, for example collaborative learning, small group work, project work, 'self-directed' or 'independent' student learning, and so on. We have compiled a list of reviews and case studies for a range of generic ICT tools (see TELRI web site page www.telri.ac.uk/Technologies/). However, the functionality offered by such tools needs to be considered as a component of a course, appropriate to the purpose of the course and the type of learning in which the students are expected to engage.

Table 3 serves to illustrate the use of typical course components to develop adoptive and adaptive learning outcomes (as defined in Table 2). In particular, we have made distinctions between learning resources, learning support and assessment methods across both forms of learning using examples from both traditional and ICT-based methods. The choice and combination of methods

and components, coupled to the assessment practices, will determine, or preferably be determined by, the bias of the course towards adoptive or adaptive learning. (Examples of bias are illustrated in the course profile grids shown in appendix 1). A strongly adaptive learning course, which aims to develop students' higher order cognitive skills, would typically be based around the students' perspectives to particular subject material and approaches to study and research of the topic. This might involve sharing ideas and work, orally and written, through debate and discussion with peer and tutors.

	Learning resources	Learning support	Assessment	Integration medium
ADOPTIVE learning	Provision of course content & learning resources	Feedback & guidance on the knowledge & practice of .. (see Table 2)		Virtual Learning Environments
Traditional	Lectures Guidance notes Books Journals	Seminars Group classes Lab work	Essays Work/lab books Multiple choice tests	
ICT-based	Web-based resources CAL, simulations Bibliographic databases Internet sites	Interactive CAL Simulations Applications software <i>E.g. spreadsheets, statistical or textual analysis, CAD, 3-D modelling, multimedia</i>	Electronic marking Computerised tests CAL, simulations (that include marking)	
ADAPTIVE learning	Availability of published & peers' work and debate	Feedback & guidance on the formation & generation of .. (see Table 2)		Virtual Learning Environments
Traditional	Discussion of work in progress Distribution of marked work	Seminars Group classes Problem classes	Essays Reflective journals Lab reports Group work	
ICT-based	Web publishing Discussion archives	Web publishing & commenting Email lists & newsgroups Discussion boards Conferencing packages	Published work Discussion contributions	

Table 3: Integrating traditional and ICT-based learning resources and learning support

The potential benefits of ICT in courses have been shown over the years to be difficult to demonstrate unless the types of learning the course intends to support are made explicit. Cost-benefits of using technology above traditional methods can only be evaluated properly when the intended aims of the ICT intervention have been identified. Firstly, a clear overview is needed of the learning processes required for the students to achieve specific learning outcomes and develop specific capabilities. Without this framework, there is a tendency for ICT methods and use of materials to be "bolt-on", time-consuming to develop or implement, and the learning gains often

remain unclear or dubious. With or without technology, identifying learning processes, and the appropriate corresponding assignments, support activities and resources, assists in enhancing the quality and cost-benefits of a course. Secondly, the overall cost-effectiveness of integrating ICT will depend on practical factors, such as the level of existing IT infrastructure, the need for remote access for some or all students, availability of course resources, timetabling and marking limitations, feasibility of distributing work, and so on.

Technology-assisted adoptive learning

Computers in assessment

For assignments where the response can be algorithmically or even heuristically programmed (adopted), computer assisted assessment tools can offer clear advantages in dealing with high volumes of marking and increasing feedback to students. With assignments designed to determine a student's level of expertise, carefully designed questions from an expert are required for assessment purposes. Responses based on established facts or reasoning will not differentiate between an expert and an adoptive learner. For this reason, computers alone cannot be used to assess the adaptive nature of expertise.

Course resources

In supporting the adoptive learning aspects of the course, such as the subject knowledge base and techniques, the effectiveness of ICT depends mostly on the degree of accessibility and flexible use of the course resources required. These include access, browsing and searching of course-related instructions and guidance notes, internet sites, CAL packages, simulations, productivity applications (such as Word, email, spreadsheets, statistical packages, computer-aided design, multiple choice questions), and so on.

The effectiveness of ICT is also influenced by the availability of traditional materials to students. If a campus library is accessible then web-based summaries can be used to provide effective introductions and guidance. (The students might be asked to produce these!). If a library is not available, such as for distance learning courses, then a complete knowledge base may have to be provided. Supplying a series of downloadable materials, e.g. electronic documents, may be a user-friendly format, again with some web-based introductory summaries and guidance. In order to avoid information overload of the students, it is advisable first to design the assignments and then provide the appropriate resources rather than to collate resources and then design assignments.

Technology-assisted adaptive learning

Student web publishing

The development of the ICT infrastructures may facilitate several methods of course support. It would seem that a significant benefit for the student is in the area of assessment. Assessment can not only promote or inhibit a student's learning, but it essentially defines the nature of such learning throughout the course. If the students are in some way given a direct (or at least improved) insight into the culture and criteria for assessment then all course content could be studied with a more direct relationship to the purpose of the course.

The clearest way of opening up the learning process is to allow students access to peers' work, either in progress or completed, along with the relevant assessment feedback. Through this approach, students can appreciate more the subject assessment concepts since they will have many

examples of expression of those concepts to consider. They may therefore gain an appreciation of the subject concepts, and importantly the assessment concepts and criteria, across many contexts. This open process can also lead to support via comments from fellow students.

The motivational aspects of students publishing their own work have been apparent throughout the TELRI Project implementation work (see <http://www.telri.ac.uk/Evaluation/>). The publishing of students' work and assessment comments has the benefit of providing the students with an insight into the assessment criteria of the course and the nature of high quality work in the course. Such an insight provides the students with guidance, orientation and motivation, in an area often difficult to define or convey.

Discussion boards

The value of discussion boards is dependent upon many factors, notwithstanding the ease of use, access, training, and so forth. In general, however, discussion forums seem to work best when associated with assignments that are clearly an integrated part of the course with explicit assessment requirements and realistic learning expectations. This avoids a majority of the messages generated by students at the onset of a course or assignment being primarily concerned with how to go about a task – mostly aimed at the tutor and not cost-effective, even if conducted through technology.

General discussions on academic issues tend to prosper when there is a very clear advantage to the student in terms of assessment gains. Such discussions are best supported by the sharing of assigned work, such as through student web publishing.

Avoiding plagiarism

Plagiarism is an ever-present problem in academia. It emphasises the two forms of learning outlined here, adoptive and adaptive learning, and leads us to ask whether the student's response was an adaptive, intellectual response or merely an adoptive response without due credit. Although publishing students' work would appear to accentuate such problems, it is relatively straightforward to overcome the incentive or tendency to plagiarise by three main methods (Evans, 2000):

1. Use dated deadlines for submissions of work that will be assessed before publishing that work. Students may learn through the work of other students and the different ideas and the approaches taken, whilst only being credited for their own contribution.
2. Use slightly differing contexts for each student submission (e.g. different books to review) so that students are required to adapt any previous work in order to apply their own assignment context. This makes their personal understanding more explicit.
3. Since the work is all published, students will be most vigilant about identifying plagiarised work, particularly if it is theirs!

Using the distinction of adoptive and adaptive learning to make explicit statements about intended outcomes, technology solutions may be categorised in a new way. From this, new systems can be designed to enhance specifically the desired learning processes that the course aims to develop in students.

Summary

The success of integrating resources and support for learning is inextricably intertwined with successful course design. Promoting and supporting the development of expertise is predominantly governed by the degree and quality of the course support provided by discussion of the learning objectives and feedback on learning development. Students recognise the benefits of course support provision, such as student web publishing and discussion tools, particularly in relation to assigned work. It allows them to gain a better insight into the assessment criteria of the course in terms of the nature and quality of the work expected, e.g. what is required to get a first, what will give you a 2-2 or a third. Consequently, the quality of students' work tends to increase, thus enhancing the overall course quality. The effectiveness of using the student web publishing and discussion approaches will be determined by their integration with the use of other course support activities and resources, such as web-based materials, lectures, seminars, and so on.

Effective practice in embedding or integrating new teaching approaches, including ICT-based ones, with traditional methods of teaching, is a continuing activity of academic development. Nevertheless, it is clear that the communication aspects of the course support as a whole, that is the sharing and discussion of students' ideas and work, are vital to promoting and facilitating adaptive (rather than adoptive) learning.

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APPENDIX 1 :

PROFILES FOR COURSE DESIGN WITH ADOPTIVE AND ADAPTIVE LEARNING BIAS

Typical Adoptive Course

ADAPTIVE ADOPTIVE

Learning outcomes	Importance in assessment of course assignments									
	low									high
	1	2	3	4	5	6	7	8	9	10
KNOWLEDGE & PRACTICE OF...										
Facts, Assertions, Rules and Laws										
Terminology, Language and Protocols										
Techniques and Procedures										
Organisation and Structure										
Established Principles and Relationships										
FORMATION & GENERATION OF										
Personal Interpretation and Meaning										
Evaluation and Decisions										
Arguments, Reasoning and Justification										
Synthesis and Conceptualisation										
Originality, Creativity and Innovation										

Typical Adaptive Course

ADAPTIVE ADOPTIVE

Learning outcomes	Importance in assessment of course assignments									
	low									high
	1	2	3	4	5	6	7	8	9	10
KNOWLEDGE & PRACTICE OF...										
Facts, Assertions, Rules and Laws										
Terminology, Language and Protocols										
Techniques and Procedures										
Organisation and Structure										
Established Principles and Relationships										
FORMATION & GENERATION OF										
Personal Interpretation and Meaning										
Evaluation and Decisions										
Arguments, Reasoning and Justification										
Synthesis and Conceptualisation										
Originality, Creativity and Innovation										

PART 2: YOU – Designing or reviewing your course

The course design process offered in this section complements the educational framework described in Section 1. It aims to provide a means for you to reflect on the intended purpose of your course, to state clearly the higher order learning you intend to occur, and to plan for it. A primary objective is to identify learning activities, support and resources that allow the demonstration and assessment of specific capabilities in a student's work. You are then offered help in clarifying the learning activities, support and resources that are needed.

Work through the following tasks to assist you in designing or reviewing your courses.

STAGE 1: LOOKING AT SUBJECT EXPERTS

TASK:

List the key characteristics and capabilities of experts in your discipline or field of study or research. *You may find it helpful to consider these in relation to the learning outcomes listed in Section 1, Table 2 (p. 6).*

Characteristics

An expert in this field is:

- .
- .
- .
- .
- .

Capabilities

An expert in this field can:

- .
- .
- .
- .
- .

STAGE 2: CHECKING THE COURSE PURPOSES

TASK:

Review or write down the overall purposes of the course - what is it supposed to achieve?
(These may be set out as aims and objectives.)

TASK:

Check that the purposes above include development of the characteristics and capabilities outlined in stage 1. If they do not, amend them as appropriate so that they reflect what students should be able to do at the end of the course.

You may find it helpful to use the grid below listing generic outcomes of adoptive and adaptive learning, as described in Section 1. Indicate by shading across the boxes the relative importance you place, or intend to place, on the development of each of the learning outcomes.

Learning outcomes	Importance in the course									
	low									high
	1	2	3	4	5	6	7	8	9	10
Adoptive										
KNOWLEDGE & PRACTICE OF....										
Facts, Assertions, Rules and Laws										
Terminology, Language and Protocols										
Techniques and Procedures										
Organisation and Structure										
Established Principles and Relationships										
Adaptive										
FORMATION & GENERATION OF										
Personal Interpretations and Meaning										
Evaluation and Decisions										
Arguments, Reasoning and Justification										
Synthesis and Conceptualisation										
Originality, Creativity and Innovation										

TASK:

From the resulting overview, consider to what extent you feel the degree of higher order learning (adaptive) reflects the intended purpose of your course. If necessary, amend the statements of course purposes again as appropriate.

STAGE 3: ANALYSING AN EXISTING COURSE

TASK:

List up to ten of the learning outcomes (i.e. the capabilities to be developed you identified in stage 2) in order of importance and then give ratings for them on a 1-5 scale in each of the columns: (5 = high and 1 = low)

COLUMN A	COLUMN B	COLUMN C	COLUMN D
Learning outcome	How important is its development in the overall course?	To what extent is its development assessed?	To what extent is its development supported i.e. through course delivery & student support provision?
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

STAGE 4: ASSESSING STUDENTS' LEARNING DEVELOPMENT

TASK:

What assignments might you use to assess each of the learning outcomes (or capabilities to be developed) that you identified at stage 2.

You might find it helpful to refer to the section on "Designing Assignments to Assess Adaptive Learning Capabilities" in Part 1. Consider when and who should make the assessment, how the assessment might be reported back to the learner, and what the learner might then do to improve.

For an existing course (stage 3), compare the scores in columns B with those in C. Where there is significant difference, decide upon and note down a change to the course assessment approach that would be likely lead to more effective assessment of the characteristic or ability.

STAGE 5: MAKING COURSE PURPOSES EXPLICIT

TASK:

To what extent are students informed of the expected nature and quality of their work and the meaning of the expected capabilities in the early stages of the course? Could this aspect of the course be improved?

You might think about giving students access to high quality course work or research papers, and making available the criteria that are used to assess their work.

STAGE 6: SUPPORTING STUDENTS' LEARNING DEVELOPMENT

TASK:

Consider how the students might be given support and guidance for the development of the expected capabilities during the course.

You may find it useful to think about how the students might be able to judge the extent to which they have achieved the range of intended learning outcomes of the course? Consider how the students might be informed of their progression during the course? Consider whether the level of feedback on student achievement you will be able to provide will be sufficient to meet their needs?

For an existing course (stage 3), compare the scores in columns B with those in D. Where there is significant difference, decide upon and note down a change to the course support methods that would be likely lead to more effective development of the characteristic or ability.

STAGE 7: PLANNING STUDENTS' LEARNING RESOURCES

TASK:

Which learning resources will provide the students with the best opportunities for developing each of the intended learning outcomes identified at stage 2?

Consider the central issues that the course addresses and which materials would be most effective for supporting the development of the specific capabilities. (If you are reviewing an existing course, consider which materials are central to the course and which may contribute to student overload.)

Consider also whether these learning resources are readily available and, if not, whether there are alternative resources that might serve the same purpose and could offer more flexible access.

STAGE 8: PLANNING COURSE DELIVERY

TASK:

What do you consider to be the most appropriate methods for course content delivery, learning support and assessment that convey the central course issues and develop the intended capabilities?

You may find it useful use the categorisation of learning resources, support and assessment approaches illustrated in Table 3. Consider also the extent to which you can justify your choices of traditional and ICT-based methods in terms of cost-benefits (e.g. on the basis of teaching efficiency and learning effectiveness).

TASK:

In what ways do you feel the chosen methods can be structured and integrated to best support the intended profile of learning outcomes?

You might consider how course activities and assignments can be best interact with respect to timetabling and the provision of guidance and feedback identified at stage 6.

Personal notes