DESIGNING MODULES FOR LEARNING

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Introduction

During the past fifty years third level education has expanded and diversified and the demands and expectations being placed on Higher Education Institutions are now formidable, with changes in the student body and increased pressure from government on costs, procedures and results. For academic staff, there are increased pressures through increased teaching loads, growing reporting and administrative requirements and pressure to develop and strengthen their research profile. Amongst academic staff surveys consistently report that teaching is a source of reward but staff say that they are working longer hours and dealing with a more diverse student group (McInnis 2000). At the same time, they still wish to improve and innovate their practice by designing and delivering effective courses and modules. The increased size and diversity of the student group has impacted on the process of course design. Biggs (1999) offers valuable suggestions for course design strategies in the context of a growing student population and Knight (2002) argues for courses in higher education to be designed in order to maximize the chance that learners will experience coherence, progression and deep learning.

Barnett et al. (2004) argue that the curriculum receives scant regard in current debates about teaching and learning in higher education but suggest that this may change in the context of quality assurance mechanisms and benchmarking. Knight (2002) points out that material on design work for teachers planning programmes in higher education is insubstantial. He suggests that there is a need for advice on programme design and argues for texts to be developed to target specific national markets. Thus, this chapter has been written to guide teachers in higher education who are currently involved in module design and would benefit from a practical manual that will steer them through the process of designing a module for the first time. It will also be of benefit to teachers who are redesigning existing modules, and wish to bring an awareness of current thinking to the task.

The focus of this chapter is the design of modules which form part of programmes in higher education. In the context of this chapter, we are taking a module to be a self contained, formally structured learning experience with a coherent and explicit set of learning outcomes and assessment.

Modules are not developed in isolation, but within a course or programme structure, and the process is informed by the external national qualifications framework and where relevant, professional body requirements. Thus, internal and external factors must be taken into account at the planning stage. In terms of designing modules, we would argue that there is a need for a planned integrated approach to the process with the focus on the learning of the student. We would suggest that academic staff can begin the process not by focusing on the content of the module and how they intend to teach it, rather by focusing on the quality of learning that can be achieved by their students.

The aim of the chapter is to support the reader in becoming a logical module planner, aware of the important decisions to be made, and the variety of possibilities available. Planning a module is a process that requires time, commitment and a thoughtful, systematic approach. We guide you through the process of structuring learning into modules and by working through the chapter, you will be facilitated to design a module that supports your students' learning. We would intend that the material presented would be adapted and modified to suit your professional context.

The chapter will bridge theory and practice in module design and deepen your understanding of the process, regardless of subject matter or institutional setting. The focus is on higher education, although much of what is suggested has application in other areas of education. Key issues in the process of module design will be explored and the relationship between educational philosophy, learner needs and the module design process itself will be analysed to ensure that they work in harmony and maximize the learning.

The chapter is structured in a number of sections, each including a practical activity entitled 'Action Trigger' for you to complete. The aim of these activities is to provide you with a hands-on opportunity to work through the design of your module of choice and to ensure that the time you invest will be productive in terms of the process and product.

Context

The traditional curriculum focused on the teacher rather than the learner. However, in recent years there has been a paradigm shift taking place, moving the emphasis from teaching to learning and a more student-centred curriculum. This change has impacted on the curriculum design process with a greater emphasis on the learning in terms of knowledge, skills and competencies within courses and modules. The focus is on how learners learn and the design of effective learning environments. Alongside this change in pedagogy, the Bologna Agreement has emphasized the need for reform to modernise European higher education.

This chapter recognizes that many countries have national qualifications frameworks and that each institution has its own realities of quality assurance procedures with which to engage. However, we will outline a generic model of module design that academic staff can take and adapt within the realities of their own institutional and national contexts.

The standpoint is taken that although modularity is 'a good thing', it does not come without problems and whilst being cognizant of these, the focus of this work is to help teachers to gain educationally sound ideas and strategies for improving learning, teaching and assessment in a modularised context.

The module design process

There are a variety of models for the design of courses in higher education (Toohey 1999; Biggs 1999) and many of the same issues are relevant in the context of designing modules. In the process of devising a module, the key is to forge educationally sound and logical links between learner needs, aims, learning outcomes, resources, learning and teaching strategies, assessment criteria and evaluation.

Framework towards Designing Modules for Learning

In Figure 1 a Framework for Module Design and Development is outlined. This provides an overview of the process, highlighting the important variables in module design and illustrating the relationships between them; however it is important to stress that it is not a linear process.
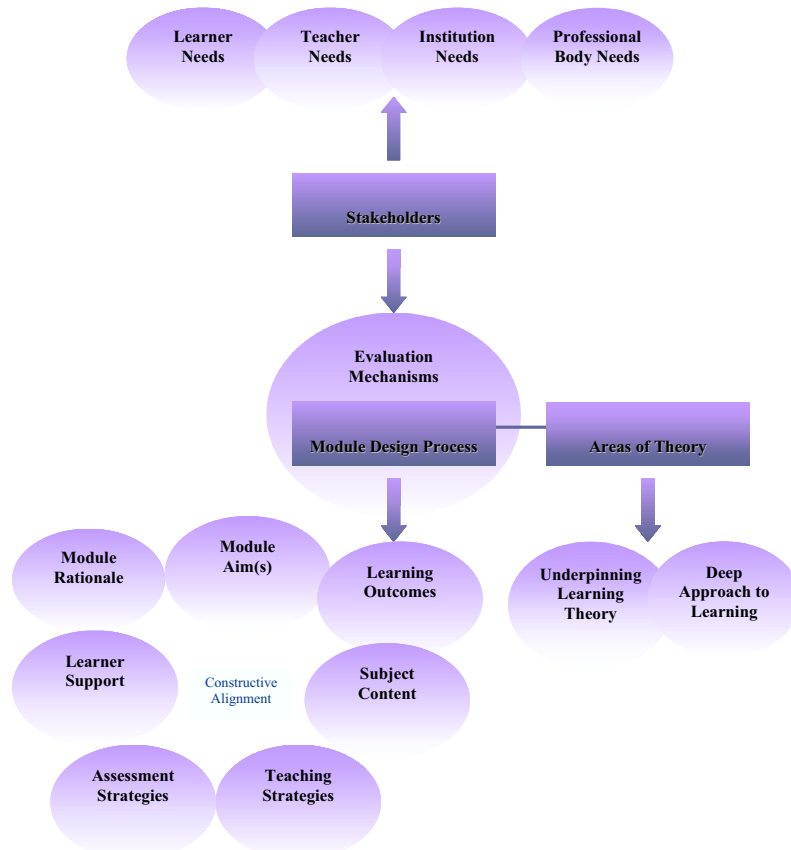

Fig. 1: Framework for Module Design and Development

A place to start

Any systematic approach to module design must be considered within the context of a theoretical framework.

Applying Relevant Theory

The question remains when designing modules for learning, why is it important to be aware of the theories that underpin learning? We would argue that a theory should make explicit the underlying psychological dynamics of events related to learning. Each one is based on different assumptions about the nature of learning and we are suggesting that you identify your own theory of learning because the strategies one might use to enhance learning will direct follow from one's orientation.

It could be argued that teachers bring to the classroom or lecture theatre an inbuilt informal theory of teaching. This theory, which may be either consciously stated or implicit in what the teachers do, has implications for the way in which students learn. It is outside the scope of this

chapter to go into depth on learning theories. Further discussion of these theories can be found in Carlile and Jordan (2005).

In addition to taking cognizance of different learning theories, it is also important o take into account that there is no universal way of learning. Brown and Atkins (1991) state that differing students will use different strategies on different tasks. They stress the importance of 'learning-for-understanding' and 'learning-for-knowledge' orientations, with learning being a continuous process of development back and forth between the two.

When designing modules, we would argue that it is important for teachers to be aware of concepts of deep and surface approaches to learning. Much research has previously been conducted on the relationship between courses and the approach students take to learning (Marton and Saljo 1976; Entwistle 1981; Gibbs 1992; Ramsden 1992; Biggs 1999). Arising from these studies, there are implications in terms of module design. Seeking to incorporate the following to your module design can offer a greater likelihood of fostering a deep approach to learning:

- sustained interaction with content and others;

- relating new ideas to previous knowledge;

- providing explicit explanations and a clear knowledge base to students;

- structuring in a reasonable student workload;

- providing opportunities for students to pursue topics in depth so that they can understand the material for themselves;

- ensuring an appropriate formative and summative assessment strategy.

These ideas resonate with teachers in today's higher education environment and have implications both for our choice of learning and teaching strategies and how we assess learning. An awareness of these approaches to learning is fundamental to the entire module design process.

Constructive Alignment: the Importance of Coherence

Constructive alignment is an approach to curriculum design that maximises the conditions for quality learning by ensuring alignment throughout the process, from the forming of learning outcomes, to the choice of teaching methods to assessment.

> "The fundamental principle of constructive alignment is that a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives so that all aspects of this system are in accord in supporting appropriate student learning."

> (Biggs 1999:25)

There are three elements involved in the process of constructively aligning your module:

1. Defining the learning outcomes;

2. Choosing the learning and teaching methods that can lead to attainment of outcomes;

3. Assessing student learning outcomes.

This is a design for learning which is most likely to encourage deep engagement from students but setting up an aligned system requires time and some thought on the part of the academic. However, we argue that a well designed module depends for its success on the interrelationship between these elements and should inform your thinking at all stages as you work through the process.

We now begin by identifying the areas that need to be addressed as this gives a clear focus to the design activity. We are not suggesting an approach in which each step needs to be completed

before the next is begun. Rather, one can move back and forth as required. It is often easier to think productively about abstract topics such as values only after thinking about more concrete issues such as curriculum content and learning and teaching strategies. A series of steps are now outlined to take you through the module design process and in the forthcoming sections of the chapter, each will be dealt with in some detail.

- Thinking through a rationale for your module

- Deciding on aims and learning outcomes for the module

- Thinking about the module content

- Exploring learning and teaching strategies and the appropriate learner support

- Focusing on assessment

- Considering learner support

- Planning a module evaluation strategy

Developing a Module Rationale

The purpose of a rationale is to serve as a broad value system for the learning in your module. However, seldom will a module be designed in isolation but rather it is more likely to form part of a programme of study and it is important to give consideration to the underlying values and beliefs about the purposes of education. The opportunity to think through and discuss such issues through the process of module design can support teachers to highlight the values that they hold as educators. We would content that your module should do more than add information to students' stock of knowledge but should be seeking to encourage a deep approach to learning.

The activity below can assist you in developing a coherent rationale statement for your module.

Action Trigger

- What are the educational goals for your module?

- What conceptions do you have of your learners?

- Why is the subject matter important?

- What are your beliefs and values about learning and teaching?

Aims and Learning Outcomes

The aim of your module indicates the general direction or orientation of a module in terms of its content and sometimes its context within a programme. An aim tends to be written in terms of the teaching intentions:

- The aim of the module is to provide an introduction to the application of statistical theory in general insurance.

- The module aims to provide an effective and common grounding in written and interpersonal skills.

The traditional way of describing modules and programmes in Higher Education has been to write in terms of the content with academics defining courses in terms of what is taught. However, recent development have encouraged a move to an outcomes based approach to course design with learning being defined in terms of what the students can do at the end of a module or programme. There is continuing debate in the literature about the value of defining learning in terms of outcomes and the effect that this may have on student learning but it is not the purpose of this chapter to enter into the debate. Although many academics have misgivings about the outcomes based approach, many of us are now required to define modules and courses in these terms. The use of learning outcomes is a means of describing the contents of a module or course in terms of the learning that is intended to happen.

A learning outcome is a statement of what the learner is expected to know, understand and / or be able to do at the end of a period of learning. Learning outcomes focus on learning rather than teaching and are not about what the teacher can provide but what the learner can demonstrate at the end of a module or course. Learning outcomes should be written taking into account level descriptors relevant to the level of study, and if relevant professional body requirements. They can support students to better understand what they can expect to know and be able to do at the end of a module. Some examples of learning outcomes follow:

On completion of the module the learner will be expected to able to:
    explain the role of accounting information in organisations

Successful students will typically be able to:
    identify and critically evaluate the strategic options available to enterprises

The phrases used to start the sentence lead to the use of action verbs and to a focus on how students will demonstrate their learning. You need to think about how you will ask your students to demonstrate their understanding. When they are being assessed students may be asked to discuss a concept, analyse a situation, describe a process or evaluate some data. These are the tasks the student actually does in order to demonstrate understanding and so these terms can be used to express the learning outcome. Bloom's Taxonomy developed in 1956 still remains one of the best aids to writing good learning outcomes There are no rules on how many outcomes per module or course but some guidelines have been given on the literature in learning outcomes in the U.K. It has been suggested that a module should have between four and eight learning outcomes and an entire programme should have up to twenty five (Moon 2002).

Teaching for Learning

In this section, we are going to explore a range of teaching methods and will focus on the methods and combinations of methods that can best realize the sort of constructive engagement with learning activities that leads to understanding (Ramsden 1992). Even the best designed modules, with very worthwhile defined learning outcomes, can fail if the teaching strategies employed are inappropriate to encourage and support the learners towards meeting the desired learning outcomes. It is useful to reflect on what we mean by a teaching strategy? Toohey (1999:152) offers the following definition:

> *"A teaching strategy is … a plan for someone else's learning, and it encompasses the presentations which the teacher might make, the exercises and activities designed for students, materials which will be supplied or suggested for students to work with, and ways in which evidence of their growing understanding and capability will be collected."*

This definition is very helpful as it emphasizes that a teaching strategy is fundamentally about supporting your student's learning. In giving consideration to how, as academics, we can teach in order to ensure that our students are engaging with the learning process, it is necessary to focus on the type of teaching strategies we can employ to achieve this end.

The following approach will help you to think through and decide on appropriate teaching strategies for your module. First, take time to read over your module aims, learning outcomes and content material. Then, focus on how best you can involve students in making sense of the material through active engagement and application.

Action Trigger

- Who are your learners? E.g. undergraduate, postgraduate, adult, international students

- What kinds of learning are you trying to achieve? E.g. knowledge, skills, attitudes.

- How are you going to deliver the content? E.g. lectures, tutorials, seminars, practicals

- What learning activities can be organized to meet the learning outcomes? E.g case studies, problem-solving, role play, group discussions

- What resources are available to you? E.g. handouts, worksheets, OHPs, visuals

- Does your teaching strategy support the learner to meet the desired learning outcomes? The matrix in Table 1 provides an opportunity for you to review a range of popular teaching strategies in higher education and the type of learning which each strategy best supports.

Tab. 1:

Learning Outcomes		Teaching Strategy	Learner Activity	Assessing for Learning
Knowledge	Transmit / Inform	Lecture Reading	Reproduce learning Linking to theory	Essay exam Assignment; Open Book exam
		Tutorial Researching	Clarify and expand Self-directed learning	Reflective Journal Assignment
	Engage	Discussion	Interpreting knowledge	Interview; Presentation; Viva
		Question & Answer Peer Teaching & Learning	Clarify knowledge Providing multiple perspectives; self insight	Quiz Self and peer assessment; Portfolio; Project
Skills		Web-based Teaching	Exploring learning; Providing multiple perspectives;	Computer Assisted Assessment
	Practice	Seminar Class Presentation Field Trip	Clarify knowledge Presentation skills Experiential	Presentation; Project Presentation Project
	Application	Laboratory	Apply theory to practice	Practical Assessment; Lab Reports
		Demonstration	Deepen understanding	Practical Assessment
		Games Problem solving	Exploring learning Transform knowledge	Set problems in Exam
		Case Study	Appraising; synthesing	Case Study Assessment
		Group work	Transform knowledge	Group Project

The table above is not a comprehensive summary of all possible teaching strategies and more detail can be found in Higgs and McCarthy (2005). The reality is that there is no shortage of teaching strategies. However, the key issue for module designers is selecting the strategies that are most likely to support the achievement of learning outcomes and are suitable for use in your teaching context taking into account the resources available to you.

Assessing your Learners

In relation to assessment, we would suggest that the fundamental principles are that the assessment methods should be in accord with the learning outcomes of the module and should foster a deep approach to learning.

Assessment is generally considered in terms of either being Formative and/or Summative. Formative assessment is used to inform both student and teacher as to how the learner is progressing. Integral to this process is the feedback that students receive from the teacher and this should be used to improve both the learning of students and the teaching practice. Summative assessment is used to grade students at the end of a module or to accredit them at the end of a programme.

Formative assessment may be used to contribute to continuous assessment but we would argue that in order for students to have the maximum opportunities to learn in a module, then there must be some option for a formative assessment which does not contribute to the final grade. Students can then obtain feedback which will allow them to address any gaps in their knowledge or skills.

Action Trigger

- What knowledge do you want to assess? Refer to your learning outcomes.

- What skills do you want to test?

- Have you built in provision for formative and summative assessment?

- What weighting do you want to give to the final exam and other forms of continuous assessment?

Despite the fact that there are a variety of assessment methods available, Brown (1999:8) notes 'that the range of ways that students are assessed is extremely limited with around 80% of assessments being in the form of exams, essays and reports of some kind.' We would encourage you to give consideration to a wide range of possible assessment methods.

Table 2 will outline a range of assessment methods to assist you in choosing an appropriate assessment taking into account the link between learning outcomes and assessment, within the context of modularity.

Tab. 2:

Learning Outcomes		Teaching Strategy	Learner Activity	Assessing for Learning
Knowledge	Transmit / Inform	Lecture Reading	Reproduce learning Linking to theory	Essay exam Assignment; Open Book exam
		Tutorial Researching	Clarify and expand Self-directed learning	Reflective Journal Assignment
	Engage	Discussion	Interpreting knowledge	Interview; Presentation; Viva
		Question & Answer Peer Teaching & Learning	Clarify knowledge Providing multiple perspectives; self insight	Quiz Self and peer assessment; Portfolio; Project
		Web-based Teaching	Exploring learning; Providing multiple perspectives;	Computer Assisted Assessment
Skills	Practice	Seminar Class Presentation Field Trip	Clarify knowledge Presentation skills Experiential	Presentation; Project Presentation Project
	Application	Laboratory	Apply theory to practice	Practical Assessment; Lab Reports
		Demonstration	Deepen understanding	Practical Assessment
		Games Problem solving	Exploring learning Transform knowledge	Set problems in Exam
		Case Study	Appraising; synthesing	Case Study Assessment
		Group work	Transform knowledge	Group Project

Assessment should be given serious consideration and reflection and the choice of assessment methods should clearly relate to the learning outcomes. There will rarely be one method of assessment which satisfies all learning outcomes for a module and we would recommend that in devising your assessment strategy, a variety of methods is included.

It is also important for module designers to think about how modularity may impact upon assessment practices and give consideration to some of the pitfalls associated with assessment within modular structures. In designing or redesigning modules, it is vital to bear in mind which parameters of assessment do you need to agree on as a group, and which can be left to individual teachers or subject coordinators. In a modular system, it is important to guard against over-assessing students based on the unit of study. Also there is a tendency in a modular curriculum to crowd the assessments with the result that students are handing in multiple assessments at the mid way point and at the end. This is an unacceptable burden for students and it is therefore vitally important that within a programme of study, the timetable of assessment is planned thoroughly in advance so the students do not face this problem.

Supporting your Learners

In designing modules consideration should be given to the type of learner support which will be required for the achievement of the learning outcomes. There are administrative issues around module design: scheduling of teachers, students, teaching activities, assessment time and module resources. Many modules are over ambitious and require more time on the part of students for their completion than is reasonable. Modules depend for their success on the careful allocation of resources, whether this is teaching rooms, laboratories, library facilities and equipment.

Whether you are teaching a module alone, or are adopting a team-teaching approach, you will find a need for support, whether it be technically subject-specific, audio-visual, information skills or information technology, and it is important to think through the issues around support.

Action Trigger

- Have you considered the implications of the likely background, qualifications and
experience of students?

- Have you considered a learner support policy?

- Have you ideas for producing a student guide for the module?

Evaluation Mechanisms

Module design and development is an ongoing process and this section will look at the kind of evaluation mechanisms that might be used to elicit meaningful information to assist you in reviewing and improving your module. This should be based upon criteria that are co-operatively developed and concerned with gathering information about the quality and effectiveness of the module. Evaluation is not just a retrospective process, but can be an integral part of the module development, informing you before, during and after the process.

When designing your evaluation strategy it is important to consider the following:

Action Trigger

- Are you designing into the module opportunities for feedback and evaluation?

- Are you using feedback and evaluative processes throughout the year not just as part of annual monitoring and review?

- Who is the evaluation for?

- Why are you carrying out the evaluation?

- What will your evaluation do?

- What kind of information do you want to collect?

- What do you plan to do with the information once collected?

Before selecting your evaluation methods within the strategy, the key thing to consider is your evaluation question i.e. what do you want to know? Your selection of methods will be determined by considering, for example, who the evaluation is for, the scale of your evaluation, the necessity for authenticity within the data collection and levels of resources available to you. A range of methods can be employed and further reading is available (Neary 2002; Posner and Rudnitsky 2001).

When designing your evaluation strategy it is important to consider when you will collect your data and how you will select your student and/or stakeholder sample. It is also recommended that something is done with any data collected and if students have been involved in the data collection, try and feedback any data and make changes as appropriate.

Conclusion

This chapter has demonstrated that the creation of a constructive learning environment requires thoughtful planning at module level. The purpose of the chapter has been to enable teachers to explore the factors that impact on the curriculum design process and to use learning outcomes as an organizing principle for module design. The focus of the chapter has been on developing coherence in the curriculum through the use of learning outcomes, teaching methods, materials and activities, and assessment. The main question to be asked is what do students need to learn and how best can they be facilitated to learn it.

We hope that you have found working through this chapter has helped to clarify the module design process and has provided you with a useful starting point to begin this journey. This brings to an end the design and plan of your module, but in a sense there is never a close, but rather it is a continuing process of reflection and review.

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