

# Curriculum design and development

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This paper was first written in 2003 as part of a project led by the London Deanery to provide a web-based learning resource to support the educational development for clinical teachers. It was revised by Judy McKimm in 2007 with the introduction of the Deanery's new web-based learning package for clinical teachers. Each of the papers provides a summary and background reading on a core topic in clinical education.

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## Aims

This paper:

- Provides an overview of the main concepts involved in course design and planning
- Raises awareness of factors which contribute to effective learning
- Enables you to incorporate educational theory into everyday practice

## Learning outcomes

After studying this paper, you will be able to:

- Describe approaches to curriculum development and design
- Plan a course or session using an outcome based approach
- Write learning objectives/outcomes which communicate the intended learning to students and others
- Recognise factors which contribute to effective teaching and learning in your own practice
- Outline implications of curriculum change
- Select appropriate strategies in changing a curriculum for your profession
- Make a more effective contribution towards curriculum design

## Content

- Introduction
- Curriculum development – an introduction
- Course design and planning – the broad context
- Curriculum development – strategies and models
  - strategies of curriculum development
  - objectives model
  - process model
  - models of curriculum development
- The elements of the curriculum:
  - aims and learning outcomes
  - content
  - teaching and learning methods
  - assessment
  - learning resources
- Implementing the curriculum
- Monitoring and evaluating the curriculum

- References
- Further reading

## Introduction

This paper is designed to provide clinical teachers with some of the background theory relating to curriculum design and course development, highlighting some of the main approaches and recent trends in medical and healthcare education. This paper is designed to be studied alongside *Teaching and Learning in the clinical context*.

As with most activities in education, curriculum development is not carried out in isolation from other activities, but is part of an iterative planning, development, implementation and review cycle. It should be noted that the term can be used to describe development at different levels: large-scale curricular reform (eg. the national review of undergraduate medical education which was carried out by all UK medical schools between 1993 – 1996 or the introduction of the Foundation curriculum), modification of existing programmes or making simple changes to one's own lessons. However, the same principles apply in a range of contexts and to both large and small-scale activities. Some forms of **educational development** include curriculum development although usually educational development refers to any kind of development activity in an educational context.

## Curriculum development – an introduction

The word **curriculum** derives from the Latin *currere* meaning 'to run'. This implies that one of the functions of a curriculum is to provide a template or design which enables learning to take place. Curricula usually define the learning that is expected to take place during a **course** or **programme of study** in terms of knowledge, skills and attitudes, they should specify the main teaching, learning and assessment methods and provide an indication of the learning resources required to support the effective delivery of the course. A curriculum is more than a syllabus. A **syllabus** describes the content of a programme and can be seen as one part of a curriculum. Most curricula are not developed from scratch and all operate within organisational and societal constraints.

The curriculum that is written and published, for example as course documentation, is the **official** or **formal** curriculum. The aim of educational development is to ensure that the official curriculum is delivered as the functional curriculum and there is not a mismatch as development turns into implementation. The official curriculum can also be distinguished from the **hidden, unofficial** or **counter curriculum**. Paul Willis' work on the sociology of schooling for example describes how the informal pupil group comprising working class 'lads' has its own sub-culture and counter curriculum which involves 'mucking about', 'doing nothing' and 'having a laff' (Willis, 1977, pp62-63). The hidden curriculum describes those aspects of the educational environment and student learning (such as values and expectations that students acquire as a result of going through an educational process) which are not formally or explicitly stated but which relate to the culture and ethos of an organisation. This highlights that the **process** of learning is as important as its **product** and as teachers we need to be aware of both the formal and informal factors which impact on learning.

### **Further reading**

If you are interested in the anthropological or sociological aspects which underpin learning in medical education then you may find reading two very different accounts of medical school training fascinating. The classic study of medical undergraduates is Howard Becker et al's *Boys in White* (1961) and for a more recent study Simon Sinclair's book *Making doctors: an institutional apprenticeship* (1997) is an account of undergraduate medical education at University College London (UCL). It covers aspects of 'official' and 'unofficial' life in medical school, focussing on the acquisition and transmission of knowledge, power and hierarchy, gender and race issues and how the students deal with the curriculum and their various clinical experiences.

### **Learning activity and reflection**

Thinking about your undergraduate education, can you list some examples of the formal curriculum?

And some examples of the hidden or unofficial curriculum?

Are there any instances where these may conflict and impact on learning?

### **My thoughts**

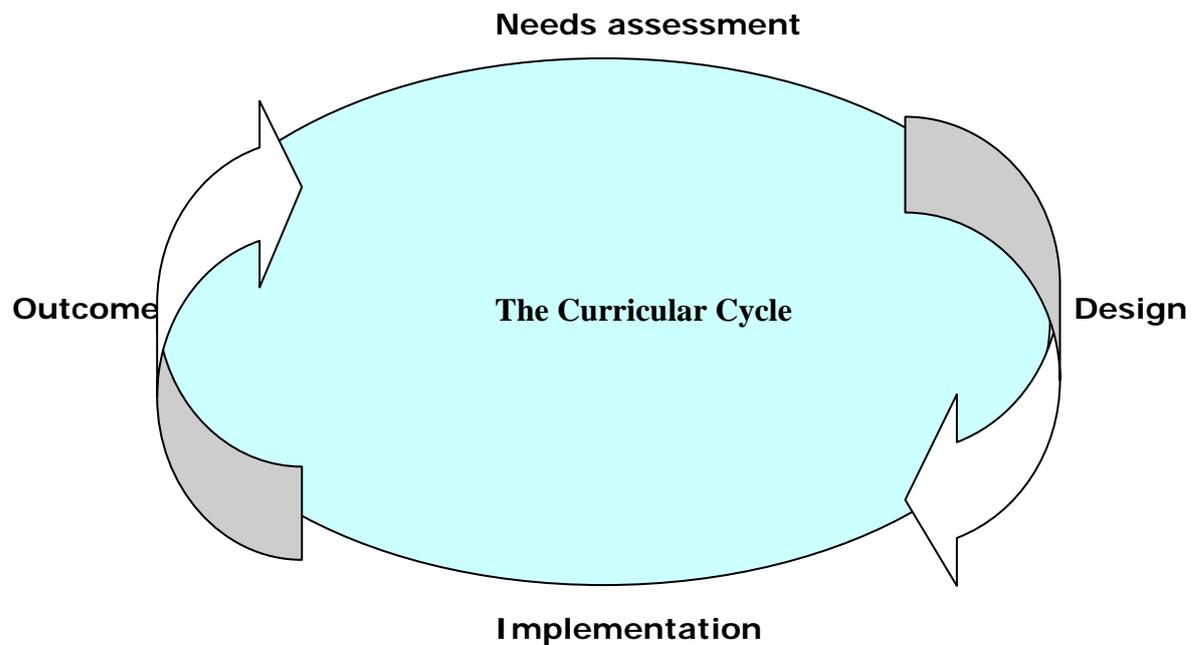
Some examples of the formal curriculum might include the prospectus, course guides, lecturers handouts etc.

And of the unofficial curriculum might include Freshers' week, rugby and other sports clubs and events, treating female or Asian students differently, the different 'tribes and territories' found in different specialties eg. surgery or general practice

Conflicts and impact on learning might include examples where drinking the night before means that students come into teaching sessions late (or not at all in the morning), some teachers regularly time the first teaching session at 0930 because they know that if they start teaching earlier, then few students will be there.

## The curricular cycle

Peyton and Peyton (1998) note that the curricular cycle “involves development through needs assessment, design and implementation phases. After this, outcomes are reviewed and evaluated against the original needs assessment. Needs change with societal expectations. The emphasis on different aspects varies with the participants’ and teachers’ perceived needs. The dynamic curriculum requires change and resource management”



*Fig 1 From Peyton and Peyton, 1998*

In developing a new programme, or modifying an existing one, there are a number of stages which must be completed within the curricular cycle as listed below.

### Stages of curriculum development

- Determine and agree the educational or professional context in which the programme is to be developed and delivered
- Define the needs of the learners in line with the requirements of professional bodies
- Determine the aims and broad learning outcomes of the programme
- Identify ideas and constraints
- Agree the broad structure and framework of the programme, the main areas of teaching and learning, the sequence of the main topics and the key assessments
- Allocate the detailed development of each topic or course area in terms of defining objectives and learning outcomes to individuals or teams
- Course teams to develop coherent programmes which have defined learning outcomes, timetables, content, appropriate teaching, learning and

assessment methods and which utilise relevant and available learning resources

- Implement and refine the programme
- Develop an appropriate and deliverable evaluation strategy
- Review and revise the course in line with feedback – has it met the identified needs of the learners and other stakeholders?

These steps are described in more detail in the subsequent sections.

### Course design and planning – the broad context

**The educational and professional context** must be discussed and clearly defined. This can reflect a number of factors: current or prevailing educational or social ideology, culture, politics, economy, students, teachers and parents, commerce and industry, professional bodies, exam boards, funding bodies and history or influence of the past. In any discipline, there may be current trends in general education which need to be addressed and specific trends or issues in medical or healthcare education which relate to the healthcare system or context. Theories of **adult learning**, **student centred learning**, **active learning** and **self-directed learning** may all influence the overall programme philosophy as may other opportunities or student needs such as the need for flexible learning programmes (eg. **distance** or **open learning**). Programmes may be **modular** in structure or **credit based**, depending on the organisation within which the curriculum is being designed.

The diagram below shows how medical education has moved from a more teacher centred, didactic approach to a more student centred approach.

#### Trends in Medical Education Curriculum Planning & Design: FLEXNER TO HARDEN

##### Flexner (1911)

Teacher-centred  
Knowledge giving  
Discipline led  
Hospital oriented  
Standard programme  
Opportunistic  
(apprenticeship)

##### Harden (1984): the SPICES model

Student-centred  
Problem-based  
Integrated  
Community oriented  
Electives (+ core)  
Systematic

The above approaches have been refined and contextualised, reflecting trends towards a more multi- or interprofessional approach as well as the impact of computer-based technology which allows for more flexible delivery in terms of time and location.

### **Trends in Medical Education: PRISMS**

- **P**ractice based linked with professional development
- **R**elevant to students and communities
- **I**nterprofessional and interdisciplinary
- **S**horter courses taught in smaller units
- **M**ultisite locations
- **S**ymbiotic (organic whole)

Bligh, Prideaux, Parsell (2001)

Higher Education as a whole has been subject to many changes and developments imposed both by governments and by changing public expectations. In medical and healthcare education, there have been additional changes reflecting change in the NHS and in the roles, responsibilities and public perceptions of the professions. Scandals such as Alder Hey, Bristol and Shipman have not only undermined public confidence in the way that healthcare professions and organisations are monitored and managed, but have led also to an increased emphasis in accountability, quality control and self-regulation. All these factors have to be taken into account in developing medical and healthcare curricula.

### **Learning activity and reflection**

Can you think of some of the key trends in medical and healthcare education which should be taken into account when developing curricula?

Some of the key trends might include:

- Managing large student numbers on multiple sites
- Introduction of national curricula/ common learning outcomes/benchmarking
- Emphasis on continuing professional development - starts at undergraduate level and leads to licensing and revalidation for practising doctors and other healthcare workers
- A redefining of quality assurance to measure defined outcomes/standards and protocols and increase accountability
- Inclusion of transferable skills in all courses: communication skills, management skills, audit, evidence-based medicine, data handling, information retrieval
- Attempts to increase multi-professional and inter-professional learning
- Increased use of IT, WWW and video-conferencing as a learning tool

In medical and healthcare education, although there are no 'national curricula' as such, a number of reports and recommendations have been produced by statutory bodies which must be adhered to by curriculum planners in order to ensure that the programme meets the needs of vocational education and training. The organisation which will deliver the course may also have requirements concerning forms of assessment and these may be explicit or implicit. National professional

standards or requirements include guidelines (eg. the General Medical Council's recommendations on undergraduate medicine "Tomorrow's Doctors", 1993, 2002), standards (eg. those produced by the National Boards for Nursing and the UKCC [now the Nursing and Midwifery Council]) or a syllabus/learning outcomes (eg. those produced for postgraduate medical education) which curriculum planners should use as templates or checklists when designing their courses or teaching sessions.

The teachers' toolkit item **Steps in large-scale curriculum development** is useful if you are interested in large scale curriculum reform.

More recently in the UK, **benchmarking standards** have been produced in all subject disciplines, these specify curriculum aspects which should form part of higher education programmes at undergraduate level and against which 'inspections' or **academic reviews** and **institutional audits** will be carried out. The linked paper *Evaluating Teaching and Learning* sets the UK educational quality context and describes national initiatives in more detail.

As well as understanding the context in which the students or trainees are learning, it is important that the teacher is aware of the **educational needs of the learners**. This means thinking about the needs of the learners both as a group and as individuals. When teaching a group of learners there are many issues to consider in terms of how a teacher's style may influence the group, group dynamics, how to deal with quiet or disruptive students and how to utilise learning resources to best advantage.

In medical education, as we have seen above, there has been a shift from a 'teacher as expert' style of curriculum (which may utilise more didactic teaching methods such as lectures) towards more **learner centred** approaches.

### **Learning activity and reflection**

What do you think we mean by learner centred?

What activities would be more appropriate to this sort of learning?

### **My thoughts**

By learner centred we mean taking the needs of the learners into account rather than the needs of the teachers or administrators. This means thinking about issues such as gender, background and previous experience or education of the learners, learning styles, barriers to learning such as dyslexia or other disability, etc.

Activities should be varied, designed to enable people to contribute, allow active participation in learning sessions, ensuring equal access to facilities, etc.

This shift reflects work done by people such as Brookfield and Ramsden who identify specific differences between the way in which adults and children learn.

The main characteristics of **adult learning** are:

- the learning is purposeful

- participation is voluntary
- participation should be active not passive
- clear goals and objectives should be set
- feedback is required
- opportunities for reflection should be provided

Acknowledgement of the needs of adult learners should be built in to the process of curriculum development and delivery at all stages, and has particular relevance to the selection of teaching, learning and assessment methods.

When planning or delivering a session or course to teach a group, the teacher might ask:

- ◆ What level of understanding and experience have they got?
- ◆ What should I be expecting from the group in terms of knowledge, skills and attitudes?
- ◆ What topics and course areas have they been studying before this particular course/session?
- ◆ What are they going on to do and what specifically should I be preparing them for?
- ◆ Does my teaching (in terms of level, pace and content) appear to be meeting their needs?
- ◆ Have I built in opportunities for flexibility to address unforeseen learning needs?

It is also important to think about individual student/trainees' learning needs. So, in addition to the above questions, when teaching individual students the teacher might ask:

- ◆ Does the student/trainee have any particular learning needs or difficulties?
- ◆ Has the learner experienced difficulties with any course areas or topics previously which might affect his/her progress?
- ◆ Does my teaching seem appropriate for this learner's needs and style of learning?

Research has demonstrated that, although individuals learn in different ways and bring different experiences and backgrounds to learning, there are certain types of activities which can enable learning to occur.

What do you think these are?

*Teaching and learning in the clinical context* describes some of the theoretical background and activities affecting learning.

But, to summarise some key aspects of learning:

- Learning can be seen to occur in four domains (eg. Bloom et al, 1956 and others): cognitive (knowledge and intellectual skills), affective (feelings and attitudes), interpersonal (behaviour and relationships with others) and psychomotor (physical skills)
- Individuals can be seen to have different learning styles and so courses

should be designed with a variety of learning (and teaching) methods

- Learners need to be treated as people and there should be opportunities for them to make contributions which are valued by teachers
- Effective learning is active – people learn best when they are engaged in an active process
- Learning has to be relevant to learners' own experience and needs and to be set within a clear context or framework. Relevance applies at a variety of levels: to the overall structure of the course or subject (eg. medicine or physiotherapy) or to the use of particular terminology
- Learning outcomes or objectives help learners to learn because they define what the learner has to do, the outcomes should be explicit and clearly linked to delivery and assessment
- Effective learning needs to be done in a safe environment. Learning is not always easy and learners must feel comfortable and able to make mistakes. Feedback should be constructive and timely.

## Curriculum Development - Strategies and models

In the last section, we looked at how, when planning a course, teachers and course developers need to think about their learners' needs in terms of the broad context of undergraduate and postgraduate education, vocational training, the needs of professional bodies and the requirements from their own organisation.

**The sort of questions that curriculum planners might ask at the start of the process should include:**

- What sort of healthcare worker do we want?
- How will we reflect health service changes and demands from external agencies?
- How will we ensure links to postgraduate requirements and training (specialist vs generalist)?
- What should the curriculum be like in terms of content, structure & function?
- How should we establish links to assessment and evaluation?
- How will we identify and overcome barriers to change?

### Strategies of curriculum development

Any curriculum needs to be developed in the light of the organisation or context in which it is going to be delivered. If a teacher is developing a small part of a course or programme, then this must fit (in terms of approach, level and content) with the overall course. If a new course is being designed and developed then there are a number of approaches that can be taken and issues that need to be addressed to meet the needs of all stakeholders involved. McKimm's description of undergraduate medical curriculum development from a project management approach can be found in Roberts and Ludvigsen, 1998, pp.101- 118.

A strategic issue which needs to be considered is whether the course design, delivery and management is **centralised** or **decentralised**. This is often out of

the hands of individuals involved in course development but has impact on all aspects of curriculum development. Centralisation can be seen at both national and organisational levels. Centralised curricula tend to be more structured and orderly and it is easier to ensure uniformity and a standard approach to teaching and learning. A centralised curriculum may allow better access to a wide pool of expertise but be less sensitive to local needs. Decentralised curricula tend to be more appropriate to students' local needs and often ensure better ownership of the course by teachers. Decentralisation can allow for a variety of approaches to design and delivery and enable comparisons of the strengths and weaknesses of each.

It can be useful to view curriculum development and design in the light of two main schools of thought, the **objectives** model and the **process** model. Although the two models are not mutually exclusive, they do represent two different philosophical approaches.

### **Objectives model**

The objectives model takes as its major premise the idea that all learning should be defined in terms of what students should be able to do after studying the programme, in terms of learning outcomes or learning objectives.

See the section below on the elements of the curriculum for further details of learning outcomes and objectives in practice.

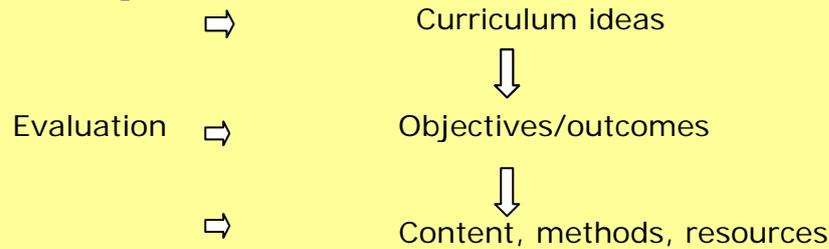
Curriculum design according to this model follows four steps:

- Reach agreement on broad aims and specific objectives for the course
- Construct the course to achieve these objectives
- Define the curriculum in practice by testing capacity to achieve objectives
- Communicate the curriculum to teachers

Care must be taken not to focus on the objectives to a trivial level or narrow specification as this limits the teacher and valuable learning experiences may be lost. Using an objectives model enables the construction of assessments which can be designed against the learning objectives. The objectives model is in step with current developments in the UK at national level which includes the use of **subject benchmarking** and **programme specifications**.

The objectives model is a systematic approach to course planning. It forms part of Outcomes Based Education (OBE) which states that "educators should think about the desirable outcomes of their programmes and state them in clear and precise terms. They should then work backwards or 'design down' in the jargon of OBE, to determine the appropriate learning experiences which will lead to the stated outcomes. By using an outcome approach, educators are forced to give primacy to what learners will do and to organise their curricula accordingly" (Prideaux, 2000).

### The objectives (outcomes) model



### Process model

The process model assumes that content and learning activities have an intrinsic value and they are not just a means of achieving learning objectives and that translating behavioural objectives is trivialising. Stenhouse (1975) argued that there were four fundamental processes of education:

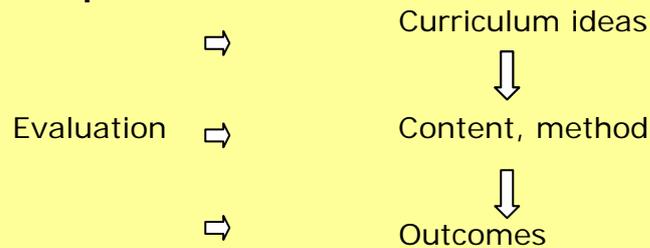
- Training (skills acquisition)
- Instruction (information acquisition)
- Initiation (socialisation and familiarisation with social norms and values)
- Induction (thinking and problem solving)

He claimed that behavioural objectives were only important in the first two processes and that in initiation and induction it would not be possible to use objectives. From this it was suggested that behavioural objectives were inappropriate for PBL, professional development or clinical problem solving.

Approaches to course design under the process model include the "intellectual approach, which examines the subject matter in terms of assumptions held in the discipline with regard to a particular body of information, knowledge and skills. It asks 'should the course be taught at the micro- or the macro-level of conceptual analysis?'" (Fry, Ketteridge and Marshall, 1999). Creative or experiential approaches involve learning "through experience and generally through the dynamics of a group process. Outcomes are defined in the existential moment of learning" (Fry, Ketteridge and Marshall, 1999).

PBL approaches can fit under the outcomes or process approach although 'pure' PBL allows the learner to define their own learning goals and places emphasis on the process of understanding the problem. This is normally seen as objective based through inference rather than objective defined. PBL courses can eventually become systematic. The process model depends a lot on the quality of the teacher and it can be more difficult to set standardised, valid and reliable assessments because performance is not being measured against stated objectives but against ideas and course content.

### The process model



“The debate about objectives raged in the 1970s and 1980s and alternative approaches to curriculum design that did not depend on statements of specific objectives such as Reynolds and Skilbeck’s ‘situational model’ became popular. By the end of the 1980s a reasonable compromise was reached. Objectives should be specific and clear but not necessarily behaviourally stated” (Prideaux, 2000). In the 1990s, outcomes based education (OBE) has been devised and Harden and others at Dundee have developed this approach in medical education.

The best approach to curriculum design is to combine the best of both approaches according to student need, teacher experience and organisational structure and resources. For example, it is useful to design the overall shape of the course, the main aims and learning objectives, broad content areas and time allocation centrally but then devolve out the detailed planning and design to those teachers who will be delivering the course so that they have ownership of their programme. The way in which the GMC or the Nursing Boards define broad curricular themes and outcomes for medical or nursing schools are examples of a devolved approach. It is important to retain some central control of the course however so that the results of evaluation and feedback can be addressed and that changes in one part of the course can be made sensibly in the light of the impact of change on other course elements. At national level, agencies with statutory responsibility for medical and health professionals’ education and training are responsible for ensuring that courses delivered by separate organisations are designed and delivered in line with their recommendations, objectives or standards. At organisational level, there should be inbuilt quality monitoring mechanisms which aim to ensure that teaching and learning, wherever it occurs, is of a high quality.

Prideaux (2000) states that he “finds it difficult to explain the difference between a significant and worthwhile objective and a well-written and well-defined outcome and again I ask myself whether such fine distinctions really matter. It is not the statements of objectives or outcomes that in themselves that are important but the questions that must be posed and answered in arriving at their definition.

Questions such as those listed below are important:

- What are the significant and enduring outcomes of medical education?
- How can we ensure that such outcomes are included in the curricula of medical schools?
- How can we ensure that the complex and difficult to define outcomes are included along with those that are more easily discerned?
- How can we ensure that learning experiences that lead to the stated outcomes are selected and used?

It is to these questions that medical educators should constantly and consistently turn”.

### **Learning activities and reflection**

Think about a course in which you are involved as a teacher.

How has this course been developed – according to the objectives or the process model?

What do you think are then main advantages and disadvantages of each?

### **Models of curriculum development**

In medical and healthcare education and training, the learners are required to acquire a complex mix of knowledge, skills and attitudes; they are expected to be able to synthesise and apply their learning to new and often demanding situations, they are also expected to be **lifelong learners**, acquiring and utilising skills and attitudes such as study skills and self-motivation throughout their working lives. In addition, learners are working in a constantly changing environment and because they work with people (including patients, colleagues and carers) they are constantly having to adapt their knowledge to meet expectations from a range of people.

When we think about designing a course, as well as thinking about the needs of the learners and theories of learning, we also need to think about how the overall design of the programme (timetabling and sequencing, teaching and learning methods) will enable students or trainees to acquire the defined knowledge, skills and attitudes. Whichever design we choose, there always has to be a sequence of learning, students need to acquire certain information or skills before they can move onto understand or apply others. During a learning process, there is always a shift from the more simple ‘building blocks’ to understanding complex principles, a shift from ‘novice’ to ‘expert’. This is often defined as a **spiral curriculum**, one in which learning is seen as a developing process with active reinforcement and assessment at key stages coupled with the acquisition of new knowledge and skills. As curriculum planners, we need to facilitate this process for our students and ensure that students are ready to move onto the next stage of learning. Assessment of some sort is usually used to determine readiness to move from one stage to another.

The majority of medical education programmes in use today (whichever model they adopt) would stress that they embody and utilise a **student centred** approach. This approach emphasises adult learning methods and approaches and uses **active learning** (in which students participate actively in the learning process) rather than a more didactic, teacher-led approach which traditionally saw students as passive recipients of knowledge, as 'empty vessels'. A programme embodying student centred approaches would typically be designed to enable students to define some of their own learning objectives, select learning resources and decide the sequence and pace of learning, the programme would also help them to develop lifelong learning skills. This approach is more resource intensive as it relies on smaller groups and much more advance planning is needed by teachers. Students may also need preparation in the shift from more didactic teaching.

In undergraduate medical education, there are a few prevailing curricular models which embody different approaches to teaching and learning.

#### **Undergraduate Medical Curriculum Models**

- **Traditional pre clinical/ clinical models**
- **Integrated (hybrid) models**
- **Problem based learning**
- **Graduate entry, 4 year programmes**

The traditional **pre-clinical/clinical** model separates (both conceptually and temporally) pre-clinical knowledge and skills from clinical knowledge and skills. This model was the prevailing model of medical education worldwide until the last twenty years and is still common across the world, particularly in former Soviet countries, Southern Europe and South America. Although the traditional approach has often been criticised for separating the underpinning 'science' from clinical medicine and which many people feel is best learned in a clinical context, it is often easier to develop and deliver a traditional course within the structure and organisation of medical schools. Many schools are divided into clinical and non-clinical departments and on a practical level, integration can often be a difficult to achieve. Barriers such as physical separation, funding mechanisms and inter-departmental rivalries are often difficult to overcome.

In some countries (such as Australia, North America and Canada) many medical courses are designed as **graduate entry** programmes, usually of about four years duration and which focus on clinical medicine. In a way, these programmes separate pre-clinical from clinical medicine, although graduate entry programmes are in themselves integrated programmes. Students entering such courses would be expected to have obtained a good first degree in a relevant subject and passed an entry test. A number of graduate entry programmes are now in place in the UK and research that considers how the graduates from these courses compare with those who have come through a five-year programme is ongoing.

In many countries, the traditional approach has largely been modified towards a more integrated approach to curriculum planning and design. An **integrated approach** is still subject centred but transcends the traditional subject

boundaries. Teaching units from subject disciplines are fused together around a meaningful organising themes/concept such as body systems or community medicine. In medical education the term **vertical integration** describes the blurring of boundaries between pre-clinical and clinical courses whereas **horizontal integration** describes how knowledge and skills from many disciplines are clustered around themes such as body systems (eg. a cardiovascular systems course might include the anatomy, physiology, biochemistry, pathology, clinical medicine, sociology, epidemiology, etc. relating to the cardiovascular system).

#### **The integrated approach:**

##### **Positive aspects:**

- Demonstrates interrelationship between disciplines and encourages holistic view of patients' problems
- Harden (1984) suggests that integrated courses enable students to learn meaningful sets of information which are more easily retained and applied to other situations. They can encourage the development of higher-level objectives eg. application of knowledge, analytical skills and problem solving
- Team teaching and collaboration between subject staff is promoted.
- Integrated courses may also enable sharing of resources between departments and teachers

##### **Limitations:**

- Some subjects/topics may be omitted or over taught and close supervision and central management of the curriculum is needed to avoid this
- Organisational boundaries such as departments and funding mechanisms may create barriers to integration

One of the most influential approaches to medical education has been **problem based learning** (PBL) as developed by Barrows, Harden and others. PBL aims to stimulate students to observe, think, define, study, analyse, synthesise and evaluate a problem. The 'problems' or cases are written to simulate real life clinical problems which are multidimensional and which encourage students to think as they would in real life clinical situations. Medical schools that have used a PBL approach include McMaster (Canada) and Newcastle (Australia) and some UK schools have also introduced a PBL course.

Have a look at the PBL section in the *Learning resources* paper for more information about PBL and how to put it into practice.

#### **Advantages of a PBL curriculum:**

- Helps a student to develop skills in solving health related problems
- Promotes self directed learning and spirit of enquiry
- Provokes a sense of critical thinking and reasoning
- Retention and application of knowledge is reinforced in a similar way to that in the clinical context
- Develops integrated body of knowledge based on real and common

problems

**Critiques of a PBL approach:**

- PBL approach is very demanding of both teachers and learners especially if they have no prior knowledge or experience of the method
- It requires increased sense of responsibility from students and flexibility from teachers
- Teachers are not always happy in the role of facilitator and may feel 'exposed' because of lack of specialist knowledge
- Students may feel that their teachers are not 'experts' when they act in facilitator role
- Extensive learning resources are needed
- Requires good teamwork and understanding between staff and students
- Traditional, standardised assessment methods are difficult to apply as may not be a uniform body of knowledge as students define own learning goals

Many medical courses (at undergraduate and postgraduate levels) utilise a modified (as opposed to a 'pure') PBL approach to learning. This can be seen more like case-based learning utilising clinical scenarios or a means of enabling students to develop problem solving skills. Learning using this method is very common in many higher education programmes such as engineering or management which encourage students to develop project management, team working and problem solving skills. Although these skills are often acquired through a PBL course, 'pure' PBL has a different focus from this and is designed to enable students to take control of their own learning, define their own learning goals and work individually and in teams to achieve the agreed learning outcomes.

Clinical medicine at all levels tends to take a **competency-based** approach to the 'training' element of the curriculum. The idea of competences can be found in many areas of vocational training, most commonly used in NVOs (National Vocational Qualifications) where trainees are assessed against stated competences and are deemed either 'competent' or 'not yet competent'.

In medicine, the idea of being 'competent' or 'not yet competent' has been developed by the use of clinical log books which are signed off by supervisors once the student has demonstrated competence. In postgraduate training, the skills and procedures expected at each level are clearly defined. Korst (1973) suggests that it is vital to identify those skills with which all students/trainees should show a high degree of competence and others with which only familiarity might be expected (Newble and Cannon, 1990 p 80). For curriculum planners, decisions should be made on how 'competence' will be defined and determined, whether a more black and white approach (competent vs not yet competent) is taken or whether there will be expected degrees of competence. For example, there would be widespread agreement that all medical graduates should be able to take blood or interpret an X-ray but there might be different expectations as to exactly what might be expected both from students at different stages of the course and as to the contexts and definitions of such competences.

Assessments such as OSCEs (Objective structured clinical examinations) are widely used to measure competence in clinical skills. See the *Assessment* paper for a detailed explanation of competency testing.

**Principles of competency based approach:**

- Systematic, based on learning outcomes/competencies deemed essential for health workers once working
- Provides trainees with high quality learning activities designed to help them master each task, periodic feedback designed to allow trainees to correct performance as they go along
- Requires trainees to perform tasks to high level of competency in work like setting
- Individual student differences in the mastery of a task are as much to do with the learning environment as the learners themselves

In planning a competency based programme or session (eg. clinical skills teaching session), five steps need to be taken:

*Step 1* carry out a needs analysis of context and of activities which will be required

*Step 2* carry out a task analysis - put major activities into sub tasks or components, resulting in a list of specific knowledge, skills and attitudes that distinguish those who perform a task competently from those who do not. This becomes the instructional content the trainee will learn.

*Step 3* deriving the objectives from the competencies required, set criterion for performance, objectives must be realistic, measurable, achievable and specific.

*Step 4* defining teaching and learning strategies

*Step 5* determining assessment strategies

In practice we often find that a mix of approaches and methods are most appropriate and hardly any modern healthcare curricula are purely subject based, integrated, PBL or competency based but are synthesised. Choices must be made about the approach in the light of the specific needs and context and then once the course is designed, it should be adhered to as much as possible.

**Learning activity and reflection**

Compare your own undergraduate training with a current programme.  
How would these be defined according to the different models described above?  
What do you think are the advantages and disadvantages of each?  
Can you think of how ideas from these models could be used to improve a course in which you are involved?

## The elements of the curriculum

The formal curriculum (course or programme) can be seen as comprising a number of elements which fall within the curricular cycle. As curriculum planners, we need to ensure that these elements are addressed within our overall strategy and specific professional or organisational context. Once these elements are in place and the programme is being implemented (either through piloting or fully) then systematic evaluation of the programme can take place.

A *Curriculum development proforma* is available to download from the Teachers toolbox. This proforma provides a means for course developers to gather and collate information needed for course planning into one document which can form the basis of course handbooks or validation documentation.

### Key aspects of the curriculum

- Aims
  - Learning outcomes/objectives (knowledge, skills and attitudes)
  - Content
  - Teaching and learning methods
  - Assessment methods
- Supporting elements:
- *Learning resources (teachers, support staff, funding, books/journals, IT support, teaching rooms)*
  - *Monitoring and evaluation procedures*
  - *Clinical placement activities*
  - *Recruitment and selection procedures, including promotional materials*
  - *Student support and guidance mechanisms*

The main aspects listed above are described in more detail in the next sections. There are a number of issues which need to be taken into account in the development and delivery of courses which are covered in other papers. For example *Ensuring equality of opportunity in teaching and learning* considers equal opportunities but for a brief introduction in relation to curriculum development see Annex 1: *Implementing equal opportunities*

The **aims and learning outcomes/objectives** need to be developed in order to ensure that the goal of producing competent graduates is achieved. **Aims** describe what the teacher is trying to achieve (eg. to encourage students to develop self directed learning skills) whereas **goals** usually describe what the course or organisation is trying to achieve (eg. to inculcate professional values and attitudes). These terms are often used interchangeably.

**Learning outcomes** guide teachers/trainers on what is expected of the learners on completion of the education/training programme. Learning outcomes also guide students on what they are expected to be able to do in terms of knowledge, skills and attitudes after completing the programme or parts of it. Correct interpretation of outcomes will guide both learners and teachers on the choice of relevant learning and teaching methods to achieve the intended learning. Those responsible for setting examinations and other assessments will also need to interpret the outcomes appropriately so that learners' performance is tested appropriately by relevant assessment techniques.

Hamilton, writing about medical education, notes that "clarity of intended educational outcome is .... essential, usually expressed through educational objectives and must underlie curriculum, student assessment, programme evaluation and student selection..... defined educational outcomes must be the reference point for the evaluation of graduates and ...must ultimately relate to the mature professional role of the graduate" (1999). In course planning then, we must think beyond our own session or course to where the students are going next and for what context we are preparing them. Hamilton goes on to say that "the task for the future is to ensure that we address outcomes that widen the scope of role and responsibility of graduates, are long in their time line and deep in their relevance to professional development" (1999).

Course planners, at whatever level, need to think about the relationship between learning outcomes or objectives, teaching and learning activities, assessment and evaluation. Constructing a simple table on which the objectives can be mapped against the other activities can be a useful starting point, even when planning a single teaching session. An example is shown below of objectives which might be found in a first year undergraduate medical or nursing course and a blank *Course mapping matrix* which can be used to assist with course planning can be found in the *Teachers Toolbox*.

Objectives should:

- "be written in the future tense
- identify important learning requirements
- be achievable and assessable
- use language which students can understand
- relate to explicit statements of achievement" (d'Andrea, V. in Fry, Ketteridge and Marshall, 1999)

<b>Learning objectives/outcomes</b>	<b>Teaching and learning activities</b>	<b>Assessment</b>
On completion of the session the student will be able to:		
1 describe the	Students to find relevant articles on	Short answer

mechanisms controlling blood pressure	the Internet relating to control of blood pressure as preparatory work Mini lecture on mechanisms controlling blood pressure Q&A discussion to ensure understanding	questions as part of examination
2 take an accurate blood pressure reading using a range of equipment	Practical demonstration by teacher followed by students practising in pairs in the clinical skills lab with feedback from teacher	OSCE station

We start to write learning objectives with a simple stem which describes what the student will be able to do as a result of our teaching intervention, such as:

*On completion of the session/course/programme, the student/trainee will be able to:*

Then we write what they will be able to do, this is the learning objective itself and should always contain an operative word such as *perform* or *describe*. These words vary depending on whether the objectives are knowledge, skills or attitudinal objectives. For example, we might use the terms define, list, name, recall or record for the 'knowledge level' of the cognitive domain, this is a lower level than say the 'analysis' level for which we might use words such as analyse, test or distinguish. **Bloom's taxonomy** is often used to classify these three domains.

To read more about different theories of learning, download/review *Learning theories* from the *Teachers toolbox* now.

By producing objectives which ensure coverage of each of the levels in the domains as well as those which cover deep, surface and strategic approaches to learning, this helps teachers and course planners. Teaching and learning strategies can also be planned which encourage and facilitate learning in the different domains and which encourage appropriate learning strategies. Learners should be made aware of the objectives at the start of the course or session, try not to cover too many outcomes in one session and try to be clear as to what you are aiming to achieve.

One of the strengths of course planning using an objectives approach is that the objectives can be used as the measure for assessing student performance. Teachers can turn well-written objectives around into assessment questions or as a starting point for designing an examination. Being aware of the different domains and of different approaches to learning and of learning styles and preferences means that teachers and course planners can take a more systematic approach to course planning.

### **Learning activities and reflection**

Find some examples of learning outcomes or objectives from a course with which

you are familiar.

Do you think these are good examples or could they be improved?

For your next teaching session, start by writing some learning outcomes. Try to determine how these will relate to teaching and learning methods and to assessment using the matrix.

The **content** of parts of the curriculum has to be studied in relation to other parts so that the curriculum forms a coherent learning programme. It should comprise and reflect a selection of knowledge, skills, values and attitudes relevant and valued by the profession, subject disciplines and by the wider society. The content is usually derived from objectives which form the basis for programme development and can be simply defined as the knowledge, skills, attitudes and values to be learned. In some countries such as the former Soviet bloc, a national curriculum is defined which stipulates all areas of course content in terms of hours to be taught, this type of curriculum imposes severe constraints on course planners and it is difficult to introduce innovations.

We should check:

- That the content reflects the job that the learners will be asked to do after training
- That the content relates directly to the learning outcomes
- That the total time given to each element of the course is appropriate and that the balance between theory and practice is appropriate
- That the content is pitched at an appropriate level for the learners

Ideas about course content can be gathered from many sources: previous courses or existing curricula at one's own organisation; national professional or discipline associations (many of the medical specialties produced core curricula in their own topics relating to undergraduate medicine eg. orthopaedics, disability and rehabilitation medicine, renal medicine and medical ethics); textbooks; other organisations' courses, which can often be found on the web and international bodies which have produced core curricula for their own subject eg. cancer medicine.

Once the objectives/ outcomes and broad content areas have been defined, this can then be developed into a programme of learning. Obviously there will be constraints in terms of time allocation, teachers' availability and access to learning resources, but it is important for course planners to plan out a timetable for the course early on in the planning process. This should include allocating time for each element of the course and mapping out the sequence of learning in a logical manner which enables students to progress throughout the course. As we have said, curriculum development is an iterative process and there will be many versions of timetables and other course documents before the programme is ready for implementation.

In many curricula, the choice of **teaching and learning methods** is not stipulated but it is left up to the teacher to select the method most appropriate to the subject and the intended learning. In some courses such as PBL curricula, the learning method is explicit in curriculum design and guidelines will probably need to be produced to support teachers and students during the learning process. The teaching and learning methods or learning experiences should be derived from the content and learning objectives in a meaningful way and the methods or the organisation of experiences should facilitate the attainment of respective objectives in the cognitive, affective and psychomotor domain

Points to keep in mind are:

- How relevant are the teaching and learning methods to the content and learning outcomes?
- How are practical skills going to be taught and supervised?
- How are students supported in independent learning and study (eg self directed learning)?
- What resources are required and available to ensure effective teaching and learning?
- Does the teaching promote critical and logical thinking at the level of the learner?
- What are the constraints affecting the teaching and learning process?
- Are the teaching and learning methods appropriate for the selected assessment methods?

With developments in new technology, and information technology in particular, there are many more opportunities for course developers to introduce innovative teaching and learning methods. This can enable learning to be more flexible, learners can study in their own time via the Internet or an Intranet, lectures may be given over the Internet or via videoconferencing reducing the need for students or trainees (and teachers) to travel. Open learning materials can be developed such as workbooks which can help to encourage self-directed study and reflective practice. With careful planning, and careful matching of learning outcomes to teaching/learning methods and assessments, technology can help to facilitate learning and use resources more effectively and efficiently.

Details of many teaching and learning methods can be found in other papers and there are many excellent textbooks which cover these issues, see the further reading section at the end of the paper.

In designing the **assessment** methods that measure students' performance, the starting point should always be the stated learning outcomes. Assessments must check that students have achieved the learning outcomes in various contexts and thus that the content has been covered. Teaching and learning methods must support the assessment strategy, if students or trainees are expected to perform well in MCQs for example, then a PBL type course with a facilitative teaching approach will not be appropriate. An assessment blueprint (or matrix) is a helpful tool to map out coverage of core content and learning outcomes against the assessment methods (see *Teachers toolbox*).

Teachers should check a number of aspects relating to assessment:

- Are the assessment methods which relate to the assessment of knowledge, skills and attitudes appropriate?

- Do the teaching and learning methods support the assessment strategy?
- Are the assessment methods reliable and valid?
- Are the assessment methods designed so that learners can achieve the minimum performance standards set in the curriculum and is there capacity for learners to demonstrate higher standards of performance (ie do the assessments enable discrimination between candidates)?
- Are the students/trainees being assessed sufficiently or are they being over-assessed?
- Are the regulations governing assessment procedures and awards clear and easy to follow and are they being applied appropriately and consistently?

See the *Assessment* paper for an in-depth look at medical and healthcare assessments.

The implementation of a new curriculum usually requires additional **learning resources** or at least a rethink of existing learning resources. Curriculum planners who are developing whole programmes need to think at a strategic level about the resources required and how these can be used effectively and efficiently. As student numbers increase at the same time as yet more technological innovations become available, there is a considerable tension between different groups of teachers and budget holders as they try to meet their own and students' expectations. For example, if teachers are trying to introduce more self directed or flexible learning either through PBL or other learning strategies, then close liaison needs to be carried out with library and IT staff as students will require good access to a wide range of texts, journals and web based resources. The same applies to teachers who are developing smaller parts of a course or single sessions, there are many resources which may be available to you and it is helpful to think about these as an integral part of curriculum development.

### **Learning activities and reflection**

Can you list some of the main resources which would be required to deliver a new curriculum?

## Learning resources required to deliver the curriculum

- Teachers, technical and administrative staff – there should be sufficient staff to deliver and support the delivery and assessment of the course. Staff should be appropriately skilled (in pedagogical as well as technical areas) and qualified and should be aware not only of their own areas of the course but also of the course as a whole in order that they can contextualise the learners' learning experiences
- Equipment including IT and AV equipment, models and simulators, laboratory and clinical equipment, whiteboards, flip charts
- Finances - the course will require adequate funding to sustain its activities
- Books, journals and multimedia resources – lists of core textbooks for each part of the course and other resources including reference texts should be identified by teachers and purchased for use by learners. These should be supported by other resources such as journals (printed and online) and multimedia packages. The library will be the main support structure for these resources but additional resources may also be delivered through an Intranet or via departmental 'libraries'
- Teaching rooms, office space, social and study space – there should be adequate provision to accommodate learners at all stages of the course as well as social and study space for students to spend time outside the classroom. There should also be sufficient space for teachers to prepare teaching and meet with students.
- Requirements for supervision and delivery of clinical teaching/placements – in courses for health professionals, these areas of the course usually comprise a large part of the curriculum. Clinical teaching is often delivered by health professionals working in practice rather than linked to the educational institution and it is important to ensure that such staff are supported and trained to deliver the course. Other requirements which need to be considered include travel and accommodation arrangements for learners and teachers.

## Implementing the curriculum

As we have seen in the earlier sections, there is no real clear dividing line between curriculum development and implementation. Once the curriculum has been developed and tested, and revised as necessary, the curriculum is ready for implementation. It is important that those involved with implementing the course (usually teachers and examiners) as well as students, interpret the curriculum correctly, because the written word is not always interpreted in the same way by different people. Ideally, the processes of development and implementation should be seamless and involve many of the same teachers and other staff as well as student representatives. This will help to ensure ownership of the new course and more effective implementation.

### Pre testing and piloting

Before starting to fully implement the curriculum it is preferable to try to **pre test** or **pilot** some or the whole of the curriculum that has been developed. The main objective of pre testing and piloting is to try out the draft curriculum in a small number of training situations and in the context in which the curriculum will be

used. This helps to highlight to the curriculum developers whether the curriculum is understandable and relevant to the users and whether it works in practice. Based on these findings, the curriculum can be modified as appropriate to meet the needs of the potential students. Sometimes there is the opportunity to **field test** the developed course to a larger number of users under real 'field' conditions.

Pre testing and piloting can help to create the most appropriate course as often the paper curriculum does not work as expected in practice because of unforeseen situations or responses by students or teachers. For example, if introducing new teaching or learning methods or new topics into a curricula, it is easy to underestimate the amount of preparation and sometimes additional training which might be required of teachers. Tools and mechanisms must be developed to ensure a systematic evaluation of the testing or piloting process.

### **Monitoring and evaluating the curriculum**

**Monitoring** can be defined as a continuous or periodic check and overseeing by those responsible for the course at every level. It should focus attention on processes and performance with the objective of drawing attention to particular features that may require corrective action. It includes putting activities in place to ensure that input deliveries, work plans, expected output and other actions are proceeding according to plans. Monitoring should enable curriculum planners to detect serious setbacks or bottlenecks of the implementation process that may cause the programme not to achieve expected learning outcomes.

### **What should be monitored?**

- Student recruitment and selection processes
  - do the candidates meet the selection criteria?
  - do the criteria provide students who are appropriate for the course?
- Teaching staff – are the teachers available, motivated and capable of teaching the new course?
- Have any training needs for teachers been identified and addressed?
- The teaching and learning process
  - how is the written curriculum translated into practice?
  - Are the teaching and learning methods appropriate?
  - Is the balance between different types of learning mode appropriate in achieving the stated outcomes?
- Assessment
  - are the assessments appropriate in terms of level, reliability and validity and do they discriminate between assessing skills, knowledge and attitudes?
  - Are the regulations and procedures appropriate and are they being followed?
- Learning resources
  - are the recommended books and journals and other teaching materials available?
  - Is access to the library and other resources adequate?
- Performance standards – are the minimum performance standards being reflected and achieved?

## **Methods of monitoring curriculum implementation**

**Observation** – this is particularly valuable in the early stages of implementing a course but should be carried out separately from observations of teacher performance. The teaching and learning process can be observed in a variety of settings and forms can be used to record the information in a standardised way. This is a time-consuming method of monitoring and can be subject to observer bias.

**Feedback questionnaires** – questionnaires can be used to collect information from staff, students and external people or groups involved with the course. Information can be sought about all aspects of a course. Questionnaires are useful to collect a large amount of information and, if both open and close questions are used, can be a rich source of data. Response rates can be low and care must be taken not to overload people with questionnaires and also to seek out ways in which responses can be encouraged eg. handing out questionnaires at the end of teaching sessions and giving time for students to complete these. It is usual practice for questionnaires to be completed anonymously.

**Focus groups/meetings/fora/interviews** – structured or semi-structured meetings (with individuals or groups) and focus groups can be another useful source of detailed information about a programme. These are time consuming and therefore are best used to probe into areas of concern or to follow up issues which have been identified through other means eg. questionnaires. It is good practice to set up regular meetings with student and staff representatives aimed specifically at reviewing the course or elements of it. Curriculum committees can also be useful sources of information about the course and help to increase ownership of the curriculum. The results from such meetings must be fed back into the overall quality assurance mechanisms so that appropriate action can be taken.

**Student assessment results** – Results from both formative and summative assessments should be analysed regularly in order to evaluate whether individual assessments are performing reliably and validly and also whether minimum set standards are being achieved. The reports from external examiners are also a very useful source of external information about the course.

**Reports** – reports which the institution has to provide for internal use (eg. absence statistics) or external agencies can be useful sources of information about the programme.

**Evaluation** is a system of feedback, providing information to planners, teachers/trainers, students, parents and decision-makers. Evaluation is a process involving ongoing activities aimed at gathering timely information about the quality of a programme.

### **Why do we need to evaluate our courses?**

- To identify successes and failures of the curriculum with a view to correcting deficiencies
- To measure if stated objectives have been achieved

- To assess if the curriculum is meeting the needs of learners, community etc
- To measure the cost effectiveness of the curriculum

#### **Some questions to ask when evaluating a course or programme**

- Whether the learning objectives are realistic and relevant
- Whether the different parts of the course relate to each other meaningfully in terms of sequence and organisation
- Whether the subject matter and content is relevant, accurate and up to date
- Whether the learners' entry requirements are well defined and at the right level
- Whether the materials and delivery are pitched at the right level for the learners at different points in the course
- Whether the balance of teaching and learning methods is appropriate and whether there is enough time to ensure learning
- Whether teachers have the knowledge and skills required to deliver the curriculum
- Whether the learning resources that have been identified are adequate, appropriate and available

See the *Evaluating teaching and learning* paper for a detailed examination of educational quality and course evaluation

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## Further reading

The books asterisked above are useful for many aspects of curriculum development and teaching and learning in general.

Another useful general education book is:

Fry, H., Ketteridge, S. and Marshall, S. (1999) *A handbook for teaching and learning in Higher Education: enhancing academic practice*, Kogan Page,

London – this book has lots of useful information on general teaching at undergraduate and postgraduate levels as well as a specific chapter on medical and dental education. The chapters on understanding student learning and outcomes based planning are especially appropriate to those interested in curriculum development.

The 3<sup>rd</sup> edition is due out in 2008.

For some 'tips for teaching' rather than in-depth theory, try some of the Kogan Page Teaching and learning in Higher Education series, for example:

Race, P. and Brown, S (1999) *500 Tips for tutors*, Kogan Page, London – this book has lots of helpful, practical suggestions for helping learners to learn. Written assuming that learning should be an active process and that students should develop study and lifelong learning skills.

Specific to clinical teaching and learning:

Dacre, J. and Nicol, M. (1996) *Clinical Skills: the learning matrix for students of medicine and nursing*, Radcliffe Medical Press, Oxon – this handbook is a useful list of all the clinical and communication skills considered necessary for doctors and nurses. The matrix identifies the skills to be acquired, the necessary level of competence and also areas where shared learning is possible between medicine and nursing. Skills are listed by body systems with subdivisions into assessment and diagnostic skills; caring, comfort and safety skills and therapeutic and technical skills.

Moore, A., Hilton, R., Morris, J., Caladine, L and Bristow, H. (1997) *The clinical educator – role development: a self-directed learning text*, Churchill Livingstone, Edinburgh – this is a package (reader and textbook) primarily written for physiotherapists. It has some interesting reading, exercises and a deeper look into some of the theoretical perspectives relevant to clinical practice than we have been able to offer here.

You may also find it useful to look at the medical education journals (either online or printed versions) for articles about course planning and curriculum development at both undergraduate and postgraduate levels. These include:

*Medical Education*, this is the official journal of ASME (the Association for the Study of Medical Education) at <http://www.mededuc.com/>

*Academic Medicine* at <http://www.academicmedicine.org/>

*Medical teacher* at <http://www.medicalteacher.org/>

*British Medical Journal (BMJ)* at <http://bmj.com/cgi/collection/teaching>

Or have a look at the Omni gateway on medical education at

<http://omni.ac.uk/browse/mesh/detail/C0013631L0013631.html>

This is a UK gateway to high quality internet resources in healthcare education.

## **Annex 1**

### **Curriculum development – implementing equal opportunities**

One of the issues to be addressed in curriculum design and delivery is the issue of equal opportunities. For example, in aiming to achieve gender equality within the education system, there are two main issues to be addressed. The first is the recognition that despite a general belief among teachers that they do not discriminate on the grounds of gender, male and female students often leave education with differential qualifications, career aspirations, and self perceptions which reflect traditional assumptions and stereotypes.

Institutions should aim to foster a climate in which a positive attitude to gender equality is actively promoted. This includes tackling the problems of differential expectations and the long-term effects of prejudice and stereotyping. Research into the position of women in science and engineering has indicated that for many women the educational climate is 'chilly' and comparably few women progress into senior positions. In medicine, the position is different. More women than men enter medical school and qualify in similar numbers. But, as in many professions, women are clustered in lower career positions at the bottom of the pyramid, whereas the majority of senior positions in clinical and in academic medicine in particular are held by men.

It is important that as teachers, we do our best to address the needs of both sexes whilst acknowledging that there are ways in which we develop and deliver the curriculum which may help perpetuate women's position.

In delivering teaching, some appropriate methods are:

- Adopting particular teaching/learning styles eg. small group work which may encourage less confident students to take a lead
- Incorporating confidence building programmes into the curriculum
- Introduction through the curriculum of role models who work in non-stereotypical areas
- The careful selection of teaching and display materials to avoid bias. Where resource materials cannot be replaced, attention can be drawn to the issue of stereotyping
- Consideration by staff of any stereotypical reasons for regarding work as acceptable or otherwise eg. a female has worked hard and the work is neat and well presented, a male student is clever but untidy

Above all, teachers will need to consider carefully and honestly whether they prefer teaching students of one or other sex, and whether as a result there are any other differences in their attitudes or approach on grounds of gender. It is helpful to be able to discuss these issues with a colleague and to enlist that colleague's help in observing practice in teaching situations which may identify unconscious variations in the treatment of students/trainees. It is important therefore that staff tackle these issues as a group and lend support to one another, recognising that all can be involved in unconscious bias which may reinforce traditional stereotypes prejudicial to the development of the individual student.

## **Curriculum planning**

Teachers should ensure that in choosing the content of their courses, in designing their schemes of work and in presenting the material to be studied, the subject matter is, as far as possible, equally appealing to both male and female students and that any stereotyped views of gender roles are not presented unquestioned.

Consideration should therefore be given by teachers to:

1. choosing activities or examples that are as 'neutral' as possible when devising work that will help teach a skill, idea or concept. This is particularly important in the early stages of learning a new subject when the traditional stereotypes about the subject in the minds of students are likely to be at their strongest.
2. ensuring that where students themselves opt for stereotypical roles they are also encouraged to consider other options eg. in career choices or class based activities
3. highlighting the achievements and influence of females doing stereotypically male activities and males doing activities traditionally associated with women's roles, by way of illustration, verbal example, written account or choice of audio-visual material. In this way teachers can also help to counter some of the traditional stereotypes still found in textbooks and other published materials.
4. providing support for students/trainees who because of previous stereotyping have not had access to the experience required to progress in certain areas of the curriculum
5. using teaching methods designed to involve students/trainees of both gender equally in discussion, question and answer and practical work

One of the main difficulties is to decide to what extent stereotyped roles should be used in order to attract one sex into an area of learning that has traditionally been dominated by the other sex. Care needs to be taken to ensure that such an approach does not merely reinforce the stereotype, this can be avoided by stressing those aspects which are of common interest to all.

## **Access to curriculum areas**

Male and female students and trainees should have access to all areas of the curriculum. Where choices are made, these should be presented to both sexes as far as possible in a neutral manner. Where there is a need to combat traditionally sexist views, students should be made aware in positive ways of why it is just as appropriate for both sexes to take up a particular option. The timetable should be as flexible as possible and to provide opportunities for students to opt for non-stereotypical areas. It is essential that previous practice or take-up of subjects should not be made the basis for setting subjects against each other.

When presented with information about a specific subject or activity students should be made aware of its connections with a range of future employment opportunities open to either sex.