

# Curriculum planning and development

Section 1  
Curriculum development

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## Introduction

Curriculum planning and development is very much on today's agenda for undergraduate, postgraduate and continuing medical education.

The days are now past when the teacher produced a curriculum like a magician produced a rabbit out of a hat, when the lecturer taught whatever attracted his or her interest and when the students' clinical training was limited to the patients who happened to present during a clinical attachment. It is now accepted that careful planning is necessary if the programme of teaching and learning is to be successful.

“Curriculum is in the air. No matter what the problem in medical education, curriculum is looked to as the solution”

Davidoff 1996

## What is a curriculum?

A curriculum is more than just a syllabus or a statement of content. A curriculum is about what should happen in a teaching programme – about the intention of the teachers and about the way they make this happen. This extended vision of a curriculum is illustrated in Figure 2.1.

Curriculum planning can be considered in 10 steps (Harden 1986b). This chapter has used these steps for its structure and the steps are reviewed in the context of the trends in medical education.

The ten steps described provide a useful checklist for planning and evaluating a curriculum.

### Identifying the need

The relevance or appropriateness of educational programmes has been questioned. It has been argued that there is often a mismatch between what is expected

of the young doctor and the competencies gained from the training programme.

The need has been recognised to emphasise not only sickness salvaging, organic pathology and crisis care, but also health promotion and preventative medicine. Aspects of medical care which have not been adequately addressed in the past include:

- communication skills
- health promotion and disease prevention
- clinical procedures such as cardiopulmonary resuscitation
- professionalism, including the development of attitudes and an understanding of ethical principles.

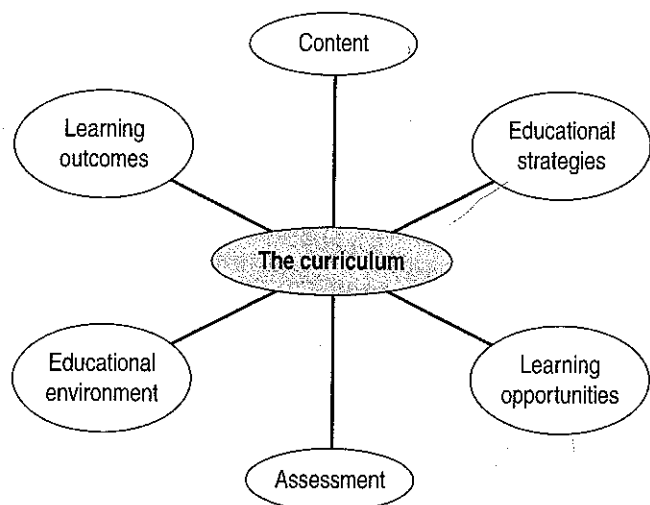
A range of approaches can be used to identify the curriculum needs (Dunn et al 1985):

- The 'wise men' approach. Senior teachers and senior practitioners from different specialty backgrounds reach a consensus.
- Consultation with the stakeholders. The views of members of the public, patients, government and other professions are sought.
- A study of errors in practice. Areas are identified where the curriculum is likely to be deficient.
- Critical-incident studies. Individuals are asked to describe key medical incidents in their experience which represent good or bad practice.
- Task analysis. The work undertaken by a doctor is studied.
- Study of star performers. Doctors recognised as 'star performers' are studied to identify their special qualities or competencies.

### Establishing the learning outcomes

If you go from this book with only one idea it should be the concept of outcome-based education.

One of the big ideas in medical education today is the move to the use of learning outcomes as the



**Fig. 2.1** A wider view of a curriculum

driver in curriculum planning (Harden 2007). An outcome-based approach to education is discussed in Chapter 20.

In outcome-based education (Harden et al 1999):

- the learning outcomes are defined
- the outcomes inform decisions about the curriculum.

This represents a move away from a process model of curriculum planning, where the teaching and learning experiences and methods matter, to a product model, where what matters are the learning outcomes and the product and where there is increasing clarity of focus for learning.

“A move from the ‘How’ and ‘When’ to the ‘What’ and ‘Whether’”

*Spady 1994*

The idea of learning outcomes is not new. Since the work of Bloom, Mager and others in the 1960s and 1970s, the value of setting out the aims and objectives of a training programme has been accepted. In practice however, long lists of aims and objectives have proved unworkable wherever possible and have been used only as window dressing. They are ignored in planning and implementing the curriculum. There are a number of reasons for this:

- The list of objectives is extensive, time-consuming to produce and of only limited assistance in decisions about the curriculum.
- The commonly accepted classification – knowledge, skills and attitudes – does not reflect clinical practice. Most clinical competencies incorporate all three domains.

These problems are avoided with the concept of learning outcomes as now adopted.

## Agreeing the content

The content of a textbook is outlined in the contents pages and in the index. The content of a curriculum is found in the syllabus, in the handouts relating to the topics covered in lectures and in students’ study guides. Traditionally there has been an emphasis in the curriculum on knowledge, and this has been reflected in the assessment. There is now increased recognition of skills and attitudes as important domains.

The content of the curriculum can be analysed and presented from a number of perspectives:

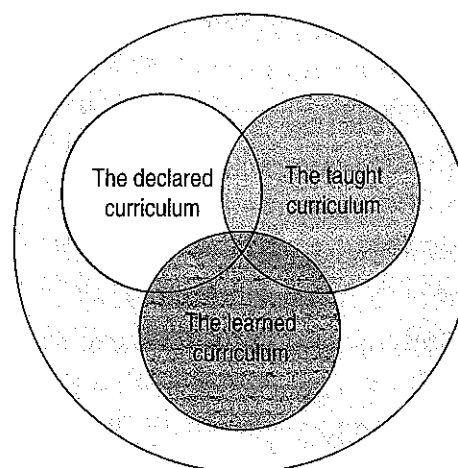
- subjects or disciplines (a traditional curriculum)
- body systems, e.g. the cardiovascular system (an integrated curriculum)
- the life cycle, e.g. childhood, adulthood, old age
- problems (problem-based)
- clinical presentations or tasks (scenario-based, case-based or task-based curriculum).

These approaches are not mutually exclusive. Grids can be prepared which look at the content of a curriculum from two or more of these perspectives.

No account of curriculum content would be complete without reference to the concept of the hidden curriculum. The ‘declared’ curriculum is the curriculum as set out in the institution’s documents. The ‘taught’ curriculum is what happens in practice. The ‘learned’ curriculum is what is learned by the student. The ‘hidden’ curriculum is the informal learning in which students engage and which is unrelated to what is taught (see Fig. 2.2).

## Organising the content

One assumption in a traditional medical curriculum is that students should first master the basic sciences, including anatomy, physiology and biochemistry, and then the applied sciences, including pathology, microbiology and epidemiology. Once they have achieved this, they move on to a study of clinical medicine.



**Fig. 2.2** The hidden curriculum (shaded area)

A common criticism of the approach is that students may not see the relevance to their future career as doctors of what is taught. Once they have passed the examinations in the basic sciences, students tend to forget or ignore what they have learned.

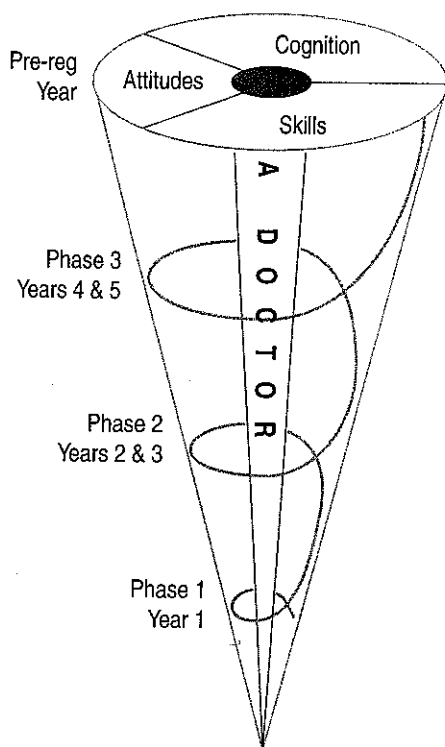
It has been advocated that the curriculum should be turned on its head, with students starting to think like a doctor from the day they enter medical school. In a vertically integrated curriculum, students are introduced to clinical medicine alongside the basic sciences in the early years of the programme. The students continue to look at the basic sciences as applied to clinical medicine in the later years.

A spiral curriculum (see Fig. 2.3) offers a useful approach to the organisation of content (Harden & Stamper 1999). In a spiral curriculum:

- there is iterative revisiting of topics throughout the course
- topics are revisited at numerous levels of difficulty
- new learning is related to previous learning
- the competence of students increases with each visit to a topic.

### Deciding the educational strategy

In planning a curriculum ask teachers to identify where they think they are at present on each continuum in the SPICES model and where they would like to go.



**Fig. 2.3** A spiral curriculum

Student-centred	Teacher-centred
Problem-based	Information-oriented
Integrated or	Subject or
interprofessional	discipline-based
Community-based	Hospital-based
Elective-driven	Uniform
Systematic	Opportunistic

**Fig. 2.4** SPICES model of educational strategies

Much discussion and controversy in medical education has related to education strategies. Should the curriculum be integrated or discipline-based? What is the role of problem-based learning? How much of the curriculum should be based in the community? The SPICES model for curriculum planning (Fig. 2.4) offers a useful tool to consider these strategies (Harden et al 1984). The model:

- represents each strategy as a continuum, thus avoiding the polarising of opinion
- acknowledges that schools vary in their approach to different strategies
- is useful in planning a new curriculum and in evaluating and changing an existing one.

### Student-centred learning

In student-centred learning, what the student learns matters, rather than what is taught. Students are given more responsibility for their own education. This is discussed further in Chapter 21 on independent learning.

With time, student-centred curricula are likely to evolve to the concept of adaptive curricula where the content delivered and the teaching and learning methods and strategies are tailored to the needs of the individual learner. Students spend different amounts of time studying a unit depending on their learning needs.

The features of an adaptive curriculum are:

- the learning outcomes are made explicit and the learning experiences are matched to the student's individual needs
- student's mastery of the core is assessed before the end of the course, and at a time when further study of the core can be arranged
- feedback is given to students and further studies are organised to meet the student's needs.

### Problem-based learning (PBL)

PBL is a seductive approach to medical education as described in Chapter 22. Eleven steps can be recognised in the PBL continuum between information-orientated and task-based learning (Harden & Davis 1998).

In task-based learning (TBL) the learning is focused round a series of tasks which the doctor may be expected to undertake (Harden et al 1996). Examples are the management of a patient with abdominal pain and the management of the unconscious patient. TBL is a useful approach to integration and PBL in clinical clerkships (Harden et al 2000).

“TBL offers an attractive combination of pragmatism and idealism; pragmatism in the sense that learning with an explicit sense of purpose is seen as an important source of student motivation and satisfaction; idealism in that it is consonant with current theories of education”

*Harden et al 1996*

## Integration and interprofessional learning

Integrated teaching is a feature of many curricula. It is discussed further in Chapter 23. Eleven steps on a continuum between discipline-based and integrated teaching have been described (Harden 2000). There is also a move to interprofessional teaching where students look at a subject from the perspective of other professions as well as their own (Hammick et al 2007).

## Community-based

“The community involves a potential broadening of perspective”

*Boaden & Bligh 1999*

There are strong educational and logistical arguments for placing less emphasis on a hospital-based programme and more emphasis on the community as a context for student learning (Boaden & Bligh 1999). Many curricula are now community-orientated with students spending 10% or more of their time in the community. This is discussed further in Chapters 15 and 16.

## Electives

“The elective is a traditional and much enjoyed part of most medical courses”

*Bullimore 1998*

Elective programmes are now firmly established and valued by staff and students in many medical schools. They have moved from being a fringe event to an important educational activity. They can be viewed as one type of student-selected component (SSC) of the curriculum.

It is no longer possible for students to study in depth all topics in a curriculum. Elective or SSCs provide students with the opportunities to study areas of interest to them, concurrently developing skills in critical appraisal, self assessment and time management.

## Systematic approach

Factors encouraging a move to a more systematic approach to medical education and curriculum planning include:

- the increasing complexities of specialist medical practice
- the need to ensure that all students have had comparable learning experiences
- the move to outcome-based education where the learning experience and curriculum content are planned to meet the learning outcomes
- the concept of a core curriculum which includes the competences essential for medical practice.

Think of the curriculum as a planned educational experience.

A range of paper and electronic methods can be used to record encounters students have with patients. Such records are analysed to see if there are gaps or deficiencies in the students' experiences.

## Deciding the teaching methods

There is no panacea, no magic answer to teaching. A good teacher is one who makes good use of a range of methods, applying each method for the use to which it is most appropriate. Later chapters of this book describe the tools available in the teacher's toolkit:

There is no holy grail of instructional wizardry which will provide a solution to all teaching problems. The teacher's toolkit should contain a variety of approaches, each with its strengths and weaknesses.

- The lecture and whole class teaching remain powerful tools if used properly. They need not be passive.
- Small-group work facilitates interaction between students and makes possible cooperative learning, with students learning from each other. Small-group work is usually an important part of problem-based learning.
- Independent learning can make an important contribution. Students master the area being studied, while at the same time they develop the ability to work on their own and to take responsibility for their own learning.

A significant development in recent years has been the application of the new learning technologies including simulation and e-learning (Issenberg et al 2005, Ellaway & Masters 2008). Computers may be used as

a source of information, as a medium for presentation of interactive patient simulations, and as a method of facilitating and managing learning.

Teaching and learning experiences can be rated in terms of:

- authenticity, with theoretical approaches at one end of the spectrum and real-life ones at the other
- formality, with different levels of formality and informality.

Teaching situations can be located in each quadrant of the formality/authenticity grid (see Fig. 2.5).

### Preparing the assessment

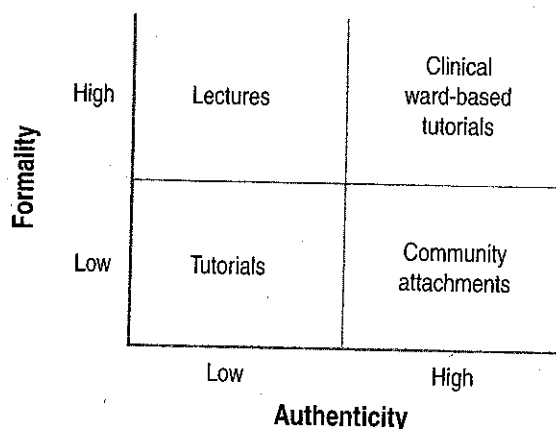
Assessment is a key component of the curriculum and is addressed in section 6 of the book. The significant effect that examinations have on student learning is well documented.

“I believe that teaching without testing is like cooking without tasting”

*Ian Lang, former Scottish Secretary*

Issues that should be addressed in assessment include:

- What should be assessed?
  - The outcome model provides a useful framework.
- How should it be assessed?
  - Which methods should be used?
  - How can one determine whether students have achieved the appropriate level of competence?
- What are the aims of the assessment process?
  - To pass or fail the student, to grade the student, to provide the student and teacher with feedback or to motivate the student?
- When should students be assessed?
  - At the beginning of the course to assess what they already know or can do, during the course or at the end of the course?



**Fig. 2.5** Teaching situations

- Who should assess the student?
  - The teacher, other teachers in the same institution, teachers from other institutions, a national board or the students themselves?

### Communication about the curriculum

Failure in communication between teacher and student is a common problem in medical education (see Fig. 2.6). Teachers have the responsibility to ensure that students have a clear understanding of:

- what they should be learning – the learning outcomes
- the range of learning experiences and opportunities available
- how and when they can access these most efficiently and effectively
- how they can match the available learning experiences to their own needs
- whether they have mastered the topic or not, and if not, what further studies and experience are required.

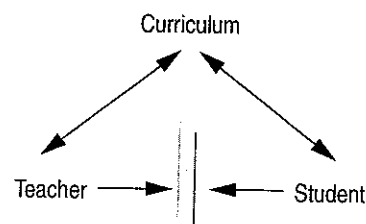
Failure to keep staff and students informed about the curriculum is a recipe for failure.

Communication can be improved in a number of ways:

- the provision of clear curriculum documentation with learning outcomes, timetables and annotated lists of learning resources included
- the use of study guides as a method of communication with the student
- the development of a curriculum map which identifies the areas to be studied and relates these to the courses where they are most appropriately learned.

### Promoting an appropriate educational environment

The educational environment or 'climate' is a key aspect of the curriculum. It is less tangible than the content studied, the teaching methods used or the examinations. It is nonetheless of equal importance.



**Fig. 2.6** Failure in communication

There is little point in developing a curriculum whose aim is to orientate the student to medicine in the community and to health promotion, if the students perceive that what is valued by the senior teachers is hospital practice, curative medicine and research. In the same way it is difficult to develop in students a spirit of teamwork and collaboration if the environment in the medical school is a competitive rather than a collaborative one.

Tools to assess this educational environment or climate in medicine have not been readily available (Genn & Harden 1986). The Dundee Ready Education Environment Measure (DREEM) can be used for this purpose (see Ch. 9)

“The educational climate is the soul and spirit of the medical curriculum”

Genn 2001

### Managing the curriculum

Curriculum management has become more important in the context of:

- increasing complexity of the curriculum
- integrated and interdisciplinary teaching
- increasing pressures on staff with regard to their clinical duties, teaching responsibilities and research commitments
- shortage of resources to support teaching
- rapid changes taking place in medical education and medical practice
- increasing demands for accountability.

In the context of undergraduate medical schools it is likely that:

- responsibilities and resources for teaching will be at a faculty rather than departmental level
- an undergraduate medical education committee will be responsible for planning and implementing the curriculum
- a teaching dean or director of undergraduate medical education will be appointed who has a commitment to curriculum development and implementation
- staff will be appointed with particular expertise in curriculum planning, teaching methods and assessment to support work on the curriculum
- time and contributions made by staff to teaching will be recognised
- a staff development programme will be a requirement for all staff
- an independent group will have responsibility for academic standards and quality assurance.

A number of approaches to curriculum development management can be recognised (Harden 1986a).

For the curriculum to be successful a mixture of management approaches is required, with the emphasis varying at different times.

- The architect approach. The emphasis is on the plans with a clear statement of expected learning outcomes.
- The mechanic approach. The emphasis is on the teaching methods and educational strategies. There is more concern about how the curriculum is working rather than where it is going. The educational strategy may itself become the goal of the curriculum rather than a means to an end.
- The cookbook approach. Consideration is given to the details of the content and how much of each component or ingredient is included. The emphasis is on the individual components rather than on the overall curriculum where the whole should be greater than the sum of the parts.
- The railway timetable approach. The emphasis is on the timetable, what courses are held and when, and the duration of each course. This simplistic view of curriculum planning ignores many of the real challenges facing medical education.

“A little known fact is that the Apollo moon missions were on course less than 1% of the time. The mission was composed of almost constant mid-course corrections”

Belasco 1996

A final word: don't expect to get the curriculum right first time. The curriculum will continue to evolve and will need to change in response to changes in medicine.

### Summary

The development of a teaching programme can no longer be left to chance. A curriculum must be carefully planned. Ten questions need to be addressed. These relate to

1. The need the training programme is intended to fulfil
2. The expected student learning outcomes
3. The content to be included
4. The organisation of the content including the sequence in which it is to be covered
5. The educational strategies to be adopted – integrated teaching is an example

6. The teaching methods to be used, including large-group teaching, small-group teaching and the use of new learning technologies
7. Assessment of the students' progress and of the teaching programme
8. Communication about the curriculum to all the stakeholders including the students
9. The educational environment
10. Management of the curriculum.

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