CURRICULUM DESIGN IN MEDICAL EDUCATION: THEORY TO PRACTICE

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INTRODUCTION

The word "curriculum" comes from a Latin term meaning track or race course.[1] In an educational environment, curriculum is defined as "all the courses of study offered by an educational institution".[2] One must be careful in differentiating between a syllabus, which is a statement of content, and curriculum, which is a plan or design upon which educational provision is based.

The four components of curriculum have been described:[3]

- Learning outcome, meaning what to expect from the learner.

- Teaching and learning processes.

- Assessment and assessment validation.

- Evaluation process.

This explains that a curriculum is a document that helps students understand what to learn and helps the teacher understand what to deliver. It also helps institutions set appropriate measures for student support, learning environment, and assessment methods.[3] Diagrammatic representation of curriculum and its components are shown in Fig. 1.
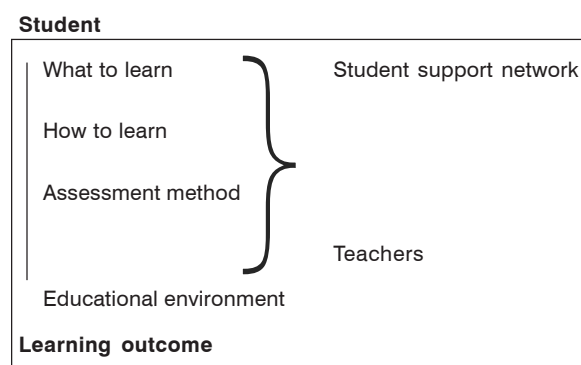

Fig. 1: Curriculum and its component.

Old and new curriculum: The old curriculum was dominated by a teacher-centred approach, where teachers used to teach whatever attracted their interest.[4] Teaching methods consisted mainly of large group tutorials and the teacher's practical experience comprised the curriculum. The students' role was mainly as information absorber, with little interaction between teachers and students. With the recent advancement in the field of technology, learners have access to the internet and a wide variety of information.[4] The teacher's role has changed to a facilitator rather than information provider.[5] With advancement in medical education, fundamental changes in curriculum have occurred, some of which are summarised below. (Table 1)

Table 1: Differences between traditional and newer approaches.[6]

Traditional teaching	Innovative approaches
Teacher-centered	Student-centred
Information gathering	Problem-based
Discipline-based	Integrated
Hospital-based	Community-based
Standard programme	Elective
Attachment- model	Systematic

Process of curriculum design: Curriculum contents have been described above. The process of curriculum design starts with identifications of needs.[7]An effort is made to minimise the gap between what is expected from young trainees and the competencies they gain during their training. With the advancement of medicine, the role of a doctor is not merely to diagnose and order treatment, but to be involved in health promotion, disease prevention and ethical practice and research. While using a multidisciplinary approach, better communication techniques have been an important learning need of the trainees. Therefore, different approaches have been adopted to identify the important training needs.[8]The most common one is discussions among senior staff, known as the Wiseman approach, where senior practitioners reach a consensus. [9]Discussion with different stakeholders, including patients, carers and government, has been used to identify needs.[10] Review of criti-

cal incidents and review of star performers can also be used for this purpose.[9]

Once the needs are assessed, the next stage is establishing the learning outcomes. Learning outcomes are central to the outcome-based approach, an approach that focuses on end product. [11] Outcomes, in the form of aims and objectives, are determined, as is the process used to execute it. Traditionally, objectives in medical curriculum are comprised of knowledge to be learnt. In modern curriculum, however, skills, learning, and attitude changes are also objectives. [10] Simply put, modern curriculum design represents a move from "How and When" to "What and whether." [4]

New themes in medical curriculum: Traditional teaching (discipline-based) involves teaching basic sciences like anatomy, physiology, and biochemistry. These subjects are strengthened with knowledge of pathology, microbiology, and epidemiology before clinical subjects are introduced. A major criticism of this type of teaching is that students forget the basic sciences by the time they reach to clinical sciences. Some novel approaches have been adopted to tackle this problem.

A vertically integrated curriculum is where students are treated as doctors from the day they enter the medical college. [12] Clinical science subjects like medicine are introduced alongside basic sciences in the early years. The students continue to study basic sciences in later years with applied clinical subjects. A good representation of this model is the spiral curriculum, as shown in figure 2. This involves regular revisiting of subjects at varying levels of difficulty.
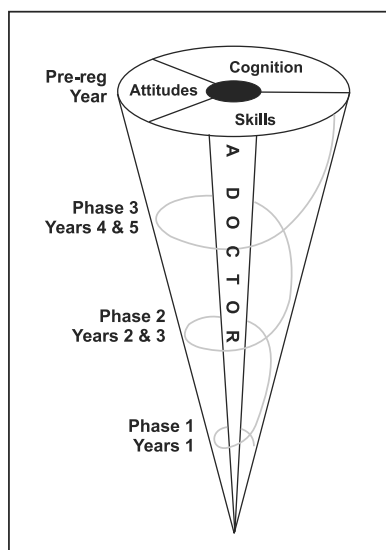

Fig. 2: Diagrammatic presentation of spiral curriculum.

Curriculum in medical education has always been thought to be overloaded. This belief has led to the concept of core and optional module curriculum,[13] which has been successfully tried in postgraduate teaching. According to this belief, curriculum consists of mandatory "core" content and an optional part. Here, a detailed discussion is required to decide what will go into the core modules. A word of caution is important here, as this approach does not entail studying fewer subjects while avoiding others. Instead, it suggests that certain aspects of the subjects are selected as "core" based on their importance.

Methods of teaching: The best teacher is one who uses all possible methods of teaching at appropriate times for appropriate audiences. Each method used in teaching has its own benefits and deficiencies. Thus, a better mix of all types of teaching methods is required to better deal with students' needs. Large group teaching is still an effective method of teaching, provided it involves the active involvement of students. Small group teaching facilitates learning from each other and is better used in problem-based learning. Independent learning is also encouraged in adult learning, as this improves students' confidence and abilities to reflect upon their experiences. Technology has brought on changes in the way teaching is currently delivered. Computers, interactive teaching, and the internet facilitate individual learning.

Going through assessment: Examinations and assessments have a documented role in students' learning. Assessment is also an important part of curriculum. Some of the important questions to address are: What to assess? How to assess? When to assess?

Who should assess? The aims of assessment can be to pass or fail students (summative assessment) or to give feedback on the work of students and teachers (prospective feedback). In a traditional setting, the emphasis is on competency (ability to display in a controlled environment). However, competency may not translate into performance (ability to perform in a real environment). All aspects of the assessment need to consider these two important criteria.

In summary, a teaching programme needs to be well-organised. Certain points need to be addressed before starting a new teaching programme.

- What are the needs of the students?
- Discussion of students' learning outcomes
- Contents of education

- What methods should be used to deliver educational contents?

- How can the assessment be best organised to determine the outcome?

- What educational environment is best for the delivery of the educational module?

Every curriculum requires an evaluation to see whether it has achieved its purpose. The evaluation can be completed through discussion among different stakeholders. Regular renewal of the curriculum is a norm with the ever-changing style of teaching medicine.

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