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Challenges of Curriculum Development for Health Sciences

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

There are many different theories for curriculum design and many affecting factors and challenges when setting or updating a curriculum. It is especially more challenging in health sciences when trying to link the usually knowledge based undergraduate teaching with the postgraduate competency based training. This paper is a literature review on challenges of curriculum development/ design in medical education in the period 1980 to 2012.

Literature review was conducted both manually and electronically with the objective to list challenges of curriculum design in health sciences as identified in relevant literature. It specifically looks into curriculum definition, standards, available models and resources among other things.

A curriculum has at least four important elements: content; teaching and learning strategies; assessment processes; and evaluation processes.

A curriculum should set expectations for learners, advise the teacher what to do and help the institution monitor student learning and evaluate their education. It has to be flexible to adapt to changes and advances in medical education.

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One of the biggest challenges is how to meet the demands of students, teachers and the health care system. Students need to identify principles in knowledge and learn to apply them to solve problems in the future.
Curriculum models are theoretically challenging. A choice of a specific model although not an objective by itself, is determined by different factors. This paper summarizes eight models for curriculum development.

Keywords: Curriculum design; curriculum development; health sciences; medical education; challenges.

1. INTRODUCTION

The curriculum is the most important tool in the passage of knowledge from teachers to learners; it helps in delivering desired knowledge, skills and competencies. There are many different theories for curriculum designs and many affecting factors and challenges when setting or updating a curriculum. It is especially more challenging in health sciences when trying to link the usually knowledge based undergraduate teaching with the postgraduate competency based training.

Although the idea of a curriculum is well documented in history since Plato in 360 BCE, no standardized definition can be found for it.

A formal definition of a curriculum is also affected by informal factors like teacher- students' interpersonal relationships, study groups, activities and other events that are termed co-curricular or extracurricular activities [1]. These factors although not part of the academic dialogue, might affect the content or the design of the curriculum and are equally important in shaping it [2]. Moreover, a curriculum is the result of human agency, and exists in three levels: what is planned for the students, what is delivered to the students, and what the students' experience [3].

This literature review is intended to list challenges of developing or updating a curriculum in health sciences. It specifically looks into curriculum definition, standards, available models and resources among other things.

2. LITERATURE REVIEW

This paper is a literature review on challenges of curriculum development/ design in health sciences/ medical education in the period 1980 to 2012. Literature review was conducted both manually and electronically. The data was retrieved as follows:

The following key words were used for search: Curriculum design, curriculum development, health sciences, medical education, module design, learning methods, teaching methods and quality enhancement.

Inclusion criteria: References were further chosen according to the following: English and Arabic language documents, publications in the years 1980- 2012, relevant topics and authenticity of the document.

A total of 30 books of highest relevance (exclusively about curriculum design/ development or has a specific section about it) were chosen. Different years of publication (1980- 2012) was considered to account for time trends.

The list was refined through abstract reading and trying to cover different aspects of the topic and diversity, until the final list of 95 references and bibliographies used in this dissertation were reached.

3. DISCUSSION

3.1 Curriculum Definition

Defining a curriculum is a difficult task because on one end of a continuum a course of study or even a topic is regarded as a curriculum; while at the other end some consider the curriculum as the whole educational experience. It is recognised that a curriculum can be very wide and would be influenced by many internal and external factors like social, professional, academic and political factors [2,4].

According to the Oxford dictionary, a curriculum is the subjects comprising a course of study in a school or college [5]. The definition of a curriculum set by the British General Medical Council (GMC) for postgraduate training is:

> "*A curriculum is a statement of the intended aims and objectives, content, experiences, outcomes and processes of a programme, including a description of the structure and expected methods of learning, teaching, feedback and supervision. The curriculum should set out what knowledge, skills and behaviours the trainee will achieve"* [6]

This definition is widely used in postgraduate medical education [2] and greatly influences this paper. Other definitions similarly describe a curriculum as an expression of intent described in the form of an aim and objectives to deliver some specific content. This intent is an idea the institution has, and adopts, of what their curriculum is about and is usually a written statement [7].

Due to the complexity of curriculum development, it might be better explained than defined as by the following description [8]:

Curriculum development describes all the ways in which training or teaching organization plans and guides learning. This learning can take place in groups or with individual learners. It can take place inside or outside a classroom. It can take place in an institutional setting like a school, college or training centre, or in a village or a field. It is central to the teaching and learning process.

3.2 Curriculum Elements

It is widely agreed now that a curriculum is not synonymous with a syllabus, but rather a syllabus is a component of it [2,9,10].

A curriculum has at least four important elements: Content; teaching and learning strategies; assessment processes; and evaluation processes [11]. Also, it encompasses the values, beliefs and choices of the institution [2]. A curriculum cannot occur in a vacuum, it has to include the learners as well as the community it serves [1].

Table 1. Details of the data sources and literature refining process

Source of literature	References yielded	Refining criteria	Final references chosen
University of Leeds library catalogue for books	918	English language, publication between 1980- 2012, Adding key words, Relevance, Manual browsing at the library of short listed references	30
Journal Database (Different journals e.g. The Lancet, British Medical journal, Higher Education Journal, Learning and teaching in higher education: LATHE).	3204	Relevance, References with full access, English language, Publication between 1981- 2012, Adding key words, Abstract review, Excluding duplicated ones	37
British Journal of Medical Education	2370		4
Informaworld Database: • Quality in higher education Journal • Research in higher education Journal • Other journals Educational websites	7989		20
The African Journal of research in Education	257		2
The international journal of health planning and management	39		2
Total references and bibliographies	14777		95

The information to include in a curriculum are part of a map of knowledge with logical demarcations, they provide students with a wide range of thoughts that necessitate developing forms that help them reach perspective [9]. Therefore, it is important to describe the purpose of the curriculum and linkage to previous education and training of the discipline.

It is important for institutions to realize that the key to curriculum development is forging an educationally sound and logically linked objectives, course content, teaching and learning methods and assessment, while taking student characteristics into consideration. At the same time, the economic and political environments could also affect this development [12].

3.3 Curriculum Standards

Important curriculum standards are the rationale and purpose of the curriculum, the model of learning, learning experiences and equality and diversity. A curriculum should set expectations for learners, advise the teacher what to do and help the institution monitor student learning and evaluate their education [2].

The medical education is a changing environment, therefore, the purpose and values of the curriculum need to be flexible to adapt to changes and advances in medical education [2,12] It also needs to respond to changing expectations of learners. This would be achieved through an ongoing process of rigorous monitoring and continuous evaluation for proper update [12].

3.4 Curriculum Dynamics

One of the biggest challenges in curriculum development is how to meet the demands of students, teachers and the health care system. This requires a dynamic and changing curriculum, a balance between clinical curriculum and health system and health policy curriculum and between undergraduate and postgraduate continuous health development, where a link seems to be missing. A lot of academic schools for example still struggle where to include health policy issues at undergraduate level [1].

Although health care system and ultimately patient care are affected by health policy issues like quality improvements and medical economics, these topics are seldom included in medical education curriculum [13].

The dynamic feature of an effective curriculum is sometimes also challenged by people who are resistant to change. This results in a so called sabretoothed curriculum [10] referring to tales about cave men who continued to teach hunting of the sabretoothed tiger long after it became extinct. An institution's behavior must allow its curriculum to be critiqued and contested [14].

3.5 Curriculum Models

A highly theoretically challenged area in curriculum design is curriculum models. A choice of a specific model although not an objective by itself, is determined by social, professional, academic and political factors [2]. Two types of models are described: Prescriptive models that outline what curriculum designers should do and how to create a curriculum and Descriptive models which describe what curriculum designers actually do and what a curriculum covers [10]. Examples of prescriptive models are the "objectives model" initially described by Tyler in 1949 and another is the outcomes based model that is much popular now.

This model has gained popularity because it focuses on student gained skills and competencies, however, the drawback is that curriculum designers might exclude high order content that is needed in the process [10].

Examples of different models for curriculum development and their main features are shown in Table 2.

The Table 2 shows that most of these models have four common issues; needs assessment; teaching and learning strategies; assessment processes; and evaluation processes [10]. These curriculum development models also show a shift to a more student focused curriculum instead of subject intense ones putting the learner in the centre of the planning and evaluation of curriculum. However, authors had different approaches to this learner centered strategy like meeting student’s needs, while others suggest that teachers should be more concerned with how students learn and to understand the different student approaches to learning. Others describe stimulating reflective learning among students as a better approach to learning. For example, Dolence’s (2004) curriculum centered strategic planning model (CCSPM) was based on a business planning model but developed specifically for learner centered higher education [17].

Table 2. Different examples of curriculum development models and their features [8,15,16,17]

Model	Author	Year	Features
1. Objectives model	Ralph Tyler	1949	Four basic questions to answer: 1. What educational purposes should the institution seek to attain? 2. What educational experiences are likely to attain the purposes? 3. How can these educational experiences be organised effectively? 4. How can we determine whether these purposes are being attained?
2. The process model	Stenhouse	1975	Similar to objectives model but specify content and principles of procedure rather than objectives
3. The situational Model	Skilbeck	1976	5 Basic components: 1. Situational analysis 2. Goal formulation 3. Programme building 4. Interpretation and implementation 5. Monitoring, feedback, assessment and reconstruction (Tyler and Richards).
4. SPICES model	Harden	1984	Student-centred Problem-based Integrated Community oriented Electives (+ core) Systematic
5. Outcomes based education (OBE)	No single authoritative model	1994	• The curriculum should be defined by the outcomes to be obtained by students. • Curriculum design proceeds by working "backwards" from outcomes to the other elements[8] • Frameworks for OBE share an emphasis on systems-level change, observable, measurable outcomes, and the belief that given time all students can learn
6. The curriculum centred strategic planning model (CCSPM)	Dolence	1995?	1. The identification and definition of Key Performance Indicators; 2. the detailing of a Learner-Centred Curriculum Architecture; 3. conducting an External Environmental Scan; 4. Internal Environmental Scan; 5. Culminating in an Action Planning Process.
7. The Systematic Curriculum and Instructional Development (SCID) model	Norton	1996	ADDIE: Analysis, Design, Development, Implementation and Evaluation
8. The six step model	Kern et al	2009	1. Problem identification and general needs assessment 2. Targeted needs assessment 3. Goals and objectives 4. Educational Strategies 5. Implementation 6. Evaluation and Feedback

3.6 Curriculum Update or Student Update?

Medical education is affected by the explosion of knowledge in health sciences and changes in contemporary medical practice [18]. Therefore, students need to identify principles in knowledge and learn to apply them to solve problems in the future, to fill their knowledge gap and critically evaluate new trends. This would be achieved through curricula that provide contextual student centered learning (see Fig. 1). This concept of problem based learning (PBL) is not an end itself but an integrated curriculum development process using systems based approach in which PBL is a part of [19].

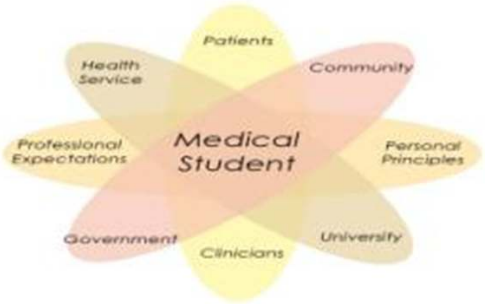

Fig. 1. Student learning relationships [15]

3.7 Financial Resources

This paper realizes that cost implications are largely not accounted for in the reviewed literature, especially for the ongoing process of monitoring and evaluation of curriculums. However, an effective curriculum needs to be flexible, adaptable and evidence driven [18] this will incur additional costs on academic institutions. However, financial constraints are not due to lack of money but often due to attitudes, values and priorities of academic administrations [20]. It is thought that research and patient care are a better source of revenue than teaching and learner centered curriculum designs which are time consuming and labor intensive.

3.8 Curriculum and Assessment

A curriculum needs to be internally and externally consistent; internally this would be achieved through clear objectives and effective management [21]. However, ensuring consistency between curriculum and assessment methods is a challenge [22]. In health sciences, assessment is an important criterion. Individual assessments for health care professionals like clinical and board examinations and institutions' assessment like for health facilities are both different and vary a lot. There is no uniform way for curriculum development or assessment in health sciences; this makes comparison difficult between inputs and outcomes and across institutions.

4. CONCLUSION

The complex process of curriculum design is faced by challenges in each of its stages of development from the initial aim or objective, how it was developed and consensus reached. The human and other resources needed for its implementation and the means of its delivery. The audience or receivers of the content and their perception of the curriculum delivered are an important part. The relevance, balance and range of knowledge it provides with the need for a dynamic and regularly updated content are further challenges. The process of curriculum assessment using proper tools with continued monitoring and regular evaluation to provide evidence base for modification are more challenges. All these stages are further complicated by the need for consistency and harmony both internally and externally and taking into consideration time and costs involved.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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