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MINI REVIEW

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Curriculum design principles for developing a module in medical education

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ABSTRACT

Curriculum, the crux of the whole educational process has its impact on health professional programs as well as healthcare need of the society. It is intended to bring about changes in learners in four domains. Curriculum design is a complex process which needs meticulous planning and extensive conceptual frameworks. Several categories of adult learning theories link intricately with curriculum development. There is increasing relevance and accountability to curricular development for the medical educators.

Module, a subunit of curriculum, is deliberated according to the curricular frame work selected. The steps in curriculum development can be applied to develop a module. Module can provide quality learning experience for facilitator and student alike. The various models of Curriculum evaluation are used in modules also.

All medical educators need to undergo a systematic and skilled training in curriculum design and module development to fulfil their responsibility of imparting quality education.

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Introduction

We are all aware that enormous problems plague medical education in India [1]. Curriculum is the crux of an educational process [2]. Its broader perspective touches anybody who's involved in teaching and learning. Curriculum design and development process has its impact not best at the health of citizens, however additionally at the future improvement and sustainability of the health professions [3]. Health professional programs need to go through changes in keeping in mind that the healthcare need of the society and periodic curriculum design, development, and review is inevitable.

It is axiomatic that medical education in India needs a paradigm shift to improve the competency of health professionals [4]. Now focus is on student centered, outcome-based approach which can promote self-directed, active learning [5]. Medical curriculum is constantly evolving and module development can effectively bring curriculum innovations [6]. Modules when designed should have the mission and vision of a curriculum, and with these guidelines, the content or syllabus is transferred to the modular structure. There is increasing relevance and accountability to curricular development for the medical educators.

The professional quality of medical educators is a growing concern, and training and knowledge in curricular design and module development for them is inevitable. This helps the stakeholders to plan special study modules.

Curriculum design

Origin from the Latin word "Curricle" for two-wheeled chariot drawn by horses and curriculum is the track on which such races were held. In education curriculum though identified as the "study track", along which students travel during a course of study is used variably with a range of meanings. Curriculum is a blue print, which is systematically planned and it brings about changes in learners in four domains: cognitive (knowledge and intellectual skills), affective (feelings and attitudes), interpersonal (behavior and relationships with others), and psychomotor (physical skills). There are often confusion between the terms syllabus and curriculum.

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A curriculum is more than just syllabus or statement of content (syllabus is content and expectations). On the other hand, syllabus is static, curriculum is dynamic and is moving. The experience of both the learner as well as the educator is living it [7].

Curriculum design involves arrangement of the components or elements of a curriculum and the process is cyclical [3]. The basic principle for the success of curriculum design process is four Cs: Clarity, Capacity, Consistency, and Commitment [8]. Just as an architect who designs building structures, so too can a curriculum designer be considered as an architect of learning experiences that learners will build. Curriculum design at any stage requires a range of abilities within the design team [9].

Frame work for curricular design

Curriculum mapping is a process for collecting and recording curriculum-related data [10]. There are several ways in which curriculum design can happen. The forward design by Tyler method, Backward design starting with the content, Central design beginning with teaching approach are distinct approaches [11]. Harden R. M. framed ten key questions to be addressed while developing a curriculum [12]. ADDIE's basic five-step model-Analysis, Design, Development, Implementation and Evaluation, Kern's six steps approach provide models in curricular design [13]. The educational strategies used advanced from Flexner Teacher-centered, Knowledge giving, Discipline-led, Hospital-oriented, Standard programme. Opportunistic model, SPICES (Student centered, Problem based, Integrated, Community based, Elective and Systematic) model to the PRISM (Product focussed, Relevant, Inter-Professional, Shorter courses, Multisite, Symboitic) model [3,14] (Table 1).

Table 1. Educational strategies advancing from Flexner to PRISM model [3].

Flexner (1911)	SPICES Model (Harden, 1984)	PRISMS Model [Bligh, Prideaux, Parsell (2001)]
Teacher-centered	Student-centred	Practice-based
Knowledge giving	Problem-based	Relevant to students and communities
Discipline-led	Integrated	Inter professional and interdisciplinary
Hospital-oriented	Community oriented	Shorter courses in small units
Standard program	Electives (+core)	Multisite locations
Opportunistic	Systematic	Symbiotic

According to Kern, six steps in curriculum design are as follows:

- Educational description
- Targeted need assessment
- Develop goals and objectives
- Develop educational strategies/activities
- Develop proper assessment methods
- Evaluate learner and finally providing feedback.

There is a need for meticulous and extensive conceptual frameworks through which curriculum development process has to occur [15]. The process should be systematic, yet flexible, on the way to accommodate implications of varying educational contexts and organizations and offer environments that can optimize learning. In ancient India, sacred texts like Vedas, Upanishads, and Bhagavad Gita offer theoretical framework to curriculum. Now theories of adult learning, student-centered learning, active learning, and self-directed learning are influencing and guiding the overall program philosophy. In medical education, the scholarly process of curriculum development is intricately linked with educational theories and methodologies [16].

The technology in this digital era is also influencing curricular design [17]. With the advent of technology, web forums started facilitating explorative learning. Online discussions have immense potential for critical thinking and capacity building [18]. The progress in technology needs to be harnessed to improve teaching and learning in competency-based curriculum as envisaged by Medical Council of India in its document, Vision 2015 [19].

Various theories of learning

Psychological foundation of curriculum is learning and motivation theories like instrumental learning theories, humanistic theories, transformative learning theory, motivational models, and reflective models. Instrumental learning theories include "Behavioural theories", "Cognitive theories", and Kolbe's "Experiential learning"; Humanistic theories: Andragogy and self-directed learning [16]. The social learning theory proposed by Albert Bandura, theory of motivation proposed by Bernard Weiner – theory of attribution, transformative learning theory that includes critical reflection, motivation theory that includes self-determination theory, valence theory etc., are some

of the principles that can be applied in framing a curriculum. Learning and teaching strategies should be devised based on these theories and assessment and evaluation are done by appropriate tools. According to the principles of adult learning, all learners build up on prior knowledge; they are motivated and self-directed learners who prefer collective learning. They seek respect and wanted acknowledgement for their learning and are practically oriented [20]. This recognition on design improves understanding of curriculum and gives wide flexibility in terms of goals, objectives, and feasible strategies within a common educational framework.

Development of a module

Module, a subunit of curriculum, is used for common solutions in key areas of medical education [21]. Teachers as architects of medical education can build up modules grounding on curricular design principles. Module development is not a linear procedure but performed via very precise techniques with qualitative team work. It is deliberated according to the curricular framework selected [22].

Modular approach is a proven effective and efficient tool that helps students to learn. Most subjects are taught with this approach [21]. The module will be self-contained although certain combinations of modules may represent a progression through the curriculum. Module can provide quality learning experience for facilitator and student alike. The basic components of a module include a statement of purpose, introduction to module use, intended learning outcomes, teaching-learning activities, media, time-table, learning resources, and evaluation plan and methods.

The steps in curriculum development are applied to develop a module also [23]. Steps include:

- Setting up a plan: Thinking through a rationale (what, why, how) for the module.
- Read and explore options, discussion with peers and colleagues.
- Deciding on aims and intended learning outcomes for the module.
- Exploring the module content.
- Devising learning and teaching strategies and the appropriate learner support.
- Focusing on assessment.
- Implementation of collaborative work involving all the stakeholders.
- Evaluation and Revision strategy.

The various models of curriculum evaluation can be applied to modules. (i) Tyler's model, (ii) Context, input, process, product model, (iii) Stake's model, (iv) Roger's model, (v) Scriven's model, (vi) Kirkpatrick's model can evaluate effectiveness of module developed [24].

All medical educators need to undergo a systematic and skilled training in curriculum design and module development to fulfill their responsibility of imparting quality education.

Conclusion

Curriculum, as we comprehend it today, has developed through the years, from precarious and muddled to a range of systematically planned and unplanned relevant learning experiences that occur in the educational process. Medical curriculum is also blended with various learning and motivational theories. The curricular designers have to foresee the future while developing curricular framework so that it should give ample space for medical educators "to think globally and act locally." Without an effective curriculum, students are not able to understand or meet the challenges of society and medical educators need to have knowledge and skill in developing a module.

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