

# Competency Based Curriculum in Medical Sciences

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## Introduction

We live in an era characterized by unprecedented growth of knowledge. The growth of knowledge is exponential and unmanageable. 'Knowledge is power'--- Only when it is rightly applied, at the right time and for the right purpose. Everwijn et al<sup>1</sup> said that knowledge acquisition does not necessarily mean successful application of the knowledge. What is more important is "Knowledge in action" and not the knowledge languishing in books or minds. Academic professionals need to possess not just the domain-specific knowledge but also greatly the ability to apply expeditiously knowledge and know-how, where and when needed. The gap between classical disciplinary knowledge and its application in the form of know-how is closing down in the recent times. This has paved way for competency based education (CBE). In medical science the same is referred to as "Competency based Medical Education"(CBME).

Competency has become a buzz-word in medical science during last few decades. The competency approach has become prominent at most stages of undergraduate and post graduate medical training in many countries.<sup>2</sup> Competencies are the learning outcomes which are explicitly mentioned by the competency based medical curricula. Many organizations advocate identifying and assessing competencies as tools for defining the outcomes with our doctors in training.<sup>3</sup>

According to Webster's dictionary competency means - ability or fitness or capacity to do a defined task.<sup>4</sup> It refers to what all a successful learner should know and be able to do upon completion of a particular program or course of study. The term also describes the ability to function in context by applying prior experience

to new situations with good effect. A competent person would greet new and challenging environments with calm and confidence.

Competency is defined by Govaerts as an individual's ability to make deliberate choices from a repertoire of behaviors for handling situations and tasks in specific contexts of professional practice.<sup>5</sup> He considers competencies as context dependent and they always imply integration of knowledge, skills, judgment and attitudes.

Competence is defined by Mulder et al as the capability of a person or organization to reach specific achievements. Personal competencies comprise : integrated performance oriented capabilities, which consist of clusters of knowledge structures and also cognitive, interactive, affective and where necessary psychomotor capabilities, and attitudes and values, which are conditional for carrying out tasks, solving problems and more generally, effectively functioning in a certain profession, organization, position or role.<sup>6</sup>

Competencies as outputs have become very important in modern professional education. The information over load and also increasingly complex modern workplace environment have placed unique demands on professional schools and programs. The exit competencies for the graduates have shifted from knowing information to being able to solve problems, communicate clearly, and use lifelong learning skills.<sup>7</sup> Instead of solely determining whether students graduate based on the accumulation of course credits, graduation should be contingent upon demonstrating mastery over a defined set of competencies.<sup>8</sup>

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Are our institutions and organizations producing quality man power befitting to the needs and expectations of the society? For a very long time the prescribed curricula in many universities are discipline and time based. Student enters the medical school and will pass through various courses for specified period of time and obtains certain credits in order to exit s a doctor. Taking Hodge's metaphor of - Tea steeping, whereby the medical student (tea bag) is put into medical school (hot water) for a suggested amount of time with the belief that the outcome will be a competent practitioner.<sup>9</sup> This kind of curriculum is focusing majorly on structure and time although a minimal attention is given to competencies and their assessment based on set objective criteria. Medical education is facing a number of impending problems. The class sizes are increasing<sup>10</sup> and the health care environment has undergone a paradigm shift due to the advent of health insurance, HMOs, corporatization and commercialization. Mark Albanese considers that medical education is facing four challenges that are unprecedented and calls them as four horse men of the medical education apocalypse. They are:-

**1) Teaching patient shortages 2) Teacher shortages 3) Conflicting systems and 4) Financial problems.**

He prescribes competency based medical education as a panacea to mitigate these problems.<sup>10</sup> Health professions education should address these problems. A resounding call has been made for reforms in health professions education, training, professional development programs especially in relation to curricular content, outcomes, and process review.<sup>11-</sup>  
<sup>15</sup> The curriculum design, delivery and assessment should align in order to provide the needed outcomes. The emphasis is on the product – What sort of doctor will be produced, rather than on the educational process.<sup>16</sup> Competency or Outcome-based education is said to improve individual performance, enhance communication and coordination across courses and programs and provide an impetus for faculty development, curricular reform, and leadership in educational innovation.<sup>17</sup>

In competency based education the expected outcomes (competencies) are clearly, unambiguously and explicitly specified. They are called competency statements. Various international,

national and local academies, boards and organizations have developed competency statements for specific domains. Core competencies reflect general expectations and specific competencies are quite specific by nature. The ACGME in 1999 developed six core competencies and 2001 adopted as requirements of all resident physicians in the United States.<sup>18</sup> They are:

**1) Patient care 2) Medical knowledge 3) Practice based learning and improvement 4) Interpersonal communication skills 5) Professionalism 6) Systems-based practice**

Canadian medical educational directives for specialists (CanMEDS) has prescribed seven roles for specialists. This was further adopted in Denmark and Netherlands also.<sup>19</sup> These roles reflect doctor as a medical expert. This has to be further complemented by six more competencies (roles) to be a good medical professional – **Communicator, Collaborator, Manager, Health advocate, Scholar and Professional.**<sup>19</sup> Such competencies as expected outcomes determine the curriculum content, and its organization, teaching methods and strategies, the course offered, the assessment process, the educational environment and the curriculum table. They also provide a frame work for curriculum evaluation.<sup>16</sup>

**The Historical Background and Evolution of Competency Construct.**

The cultural climate of 1960s and early 1970s fragmented the curricula and de-emphasized the basic skills. This resulted in lower scores by students in student achievement tests and classrooms examinations reflecting reduced educational effectiveness. Experts in the educational area initiated “back to basics” movement. Emphasis was placed on minimum standards and performance competencies at all educational levels.<sup>20</sup> The public voice called for increased competence even in those professions (like medicine) which were immune to consumerism. Public health leaders also called for competency based training.<sup>21</sup> They viewed that competence based education can produce a workforce which can better handle the populations' needs because training is contextualized.

American Dietetic Association, State board of higher education of university of Illinois joined this movement early which may be called “competency movement”, and developed guidelines and edicts for the paradigm shift in

education. These organizations were also instrumental in implementation of several competency based programs.<sup>22-24</sup> **Competence** is the capacity to realize “up to standard” the key occupational tasks that characterize a profession.

**Key occupational tasks** are the characteristic for a profession. A profession may consist of 20-30 key occupational tasks.<sup>25</sup>

**Core competencies** are those which are needed to realize a key occupational task at a satisfactory or superior level. They are further categorized into two groups as:

a) **Domain – specific** :- Includes clusters of knowledge, skills and attitudes within one specific content domain in the profession.

b) **Generic** :- They are needed in all content and can be utilized in new professional situations (transfer).

**Model of Competence** in a specific context and may be closer to real life situation. Knowledge and skills are observable and also discussible as they are visible and easy to measure, they constitute the visible part of iceberg whereas the attitudes, values, personality traits

are not easily measureable and concealed hence they constitute the hidden part of iceberg. This model was given in 1993 by Spencer and Spencer.<sup>26</sup>

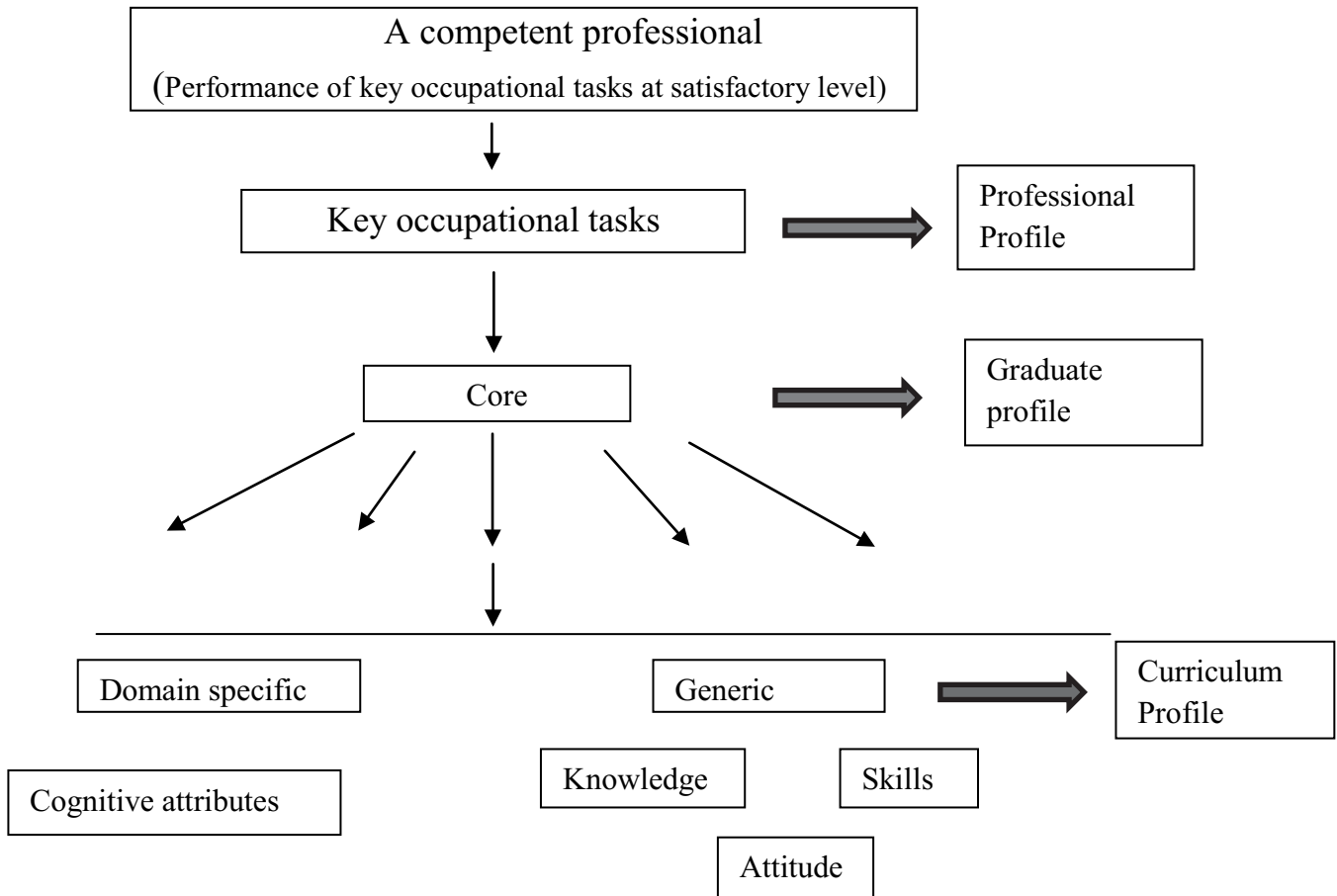
**Competency Based Curriculum – A road map for CBME**

Curriculum states the aims, objectives, content, outcomes and processes of a training or educative program. It includes a description of the methods of learning, teaching, feedback and supervision. It should describe the knowledge, skills, attitudes and behaviors that the learner will achieve.<sup>27</sup>

In recent years the research output in different specialties of medicine have significantly raised the interest in favor of CBME.<sup>28</sup> The features of CBME are:

**1) A focus on curricular outcomes**

The traditional curriculum (discipline and time based) fails to ensure that all medical graduates demonstrate required context based competence. CBME is focused on outcomes, it is inherently tied and related to the expected needs along with explicit measurable definitions of all competencies required to be attained.<sup>29-31</sup>



**Diagram 1 Showing the relation between Competence, Core Competencies and constituting (domain specific and generic) competencies. (Wim Kouwenhoven of VU University , Amsterdam, Netherlands)**

## 2) An emphasis on abilities

Competencies constitute the organizing principle of curricula. Curriculum is organized around a list of competencies not around knowledge objectives. The curricular elements are structured on one another reflecting constructivist model. Constructing knowledge through active participation is the hallmark of constructivism. CBME has adopted constructivist model.

## 3) A de-emphasis on time based learning

Students are allowed to learn at their own pace depending on their learning abilities. Those who develop competencies fast can always move through the fast track and slow learners can take their own time.

## 4) The promotion of learner centeredness

Learner is given enough flexibility in learning but acquisition of competence is mandatory before moving on further. The curriculum designers need to structure the sequence of opportunities and experiences to the students so that on graduation they are qualified beginners. There should be adequate representation of domain specific as well as generic competencies as needed for the profession in the curriculum.

## Reductionist trap of CBME

The competencies are reduced into a number of smaller competencies (sub-competencies) and into an inventory of longer and longer lists with increasing clarity. This kind of deconstructing a task to a catalogue of check-list amounts to over detailing. The "whole" may be forgotten being too pre-occupied with the "parts". Breaking down the competencies into smallest observable units, creating endless nested-lists of abilities can equally frustrate teachers and learners.<sup>29</sup>

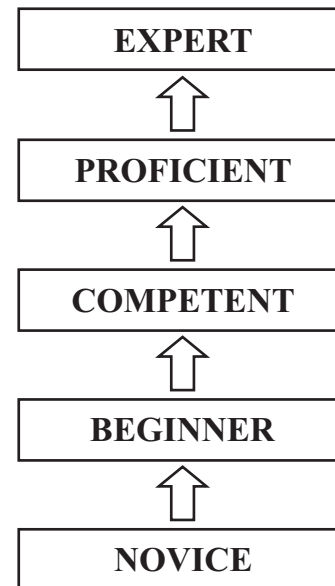
Few obstacles for CB-Curriculum are listed below<sup>30</sup> :-

- 1) Poor knowledge about the principles of CBME
- 2) Educating the educators
- 3) Time needed for staffing and educators
- 4) Implementation strategies are new and unknown to the educators
- 5) Development of evaluation technique needs meticulous approach
- 6) Changing the educational culture
- 7) Shrinking financing for health care education

## Competency Continuum<sup>10</sup>

Competency is neither the beginning nor the end on a

scale depicting the journey of a learner from the 'Novice' to 'Expert'. Competency is precisely the middle point in this process.



**Diagram 2.**

## Showing the steps in professional development

Knowledge, skills and attitudes do evolve quantitatively and also qualitatively when a novice moves in a graded manner to become an expert. It is not a time bound phenomenon and the transition need not continue and culminate in becoming expert. The growth may stagnate anywhere in between or may rise even to beyond expert stage depending on several factors.<sup>31</sup>

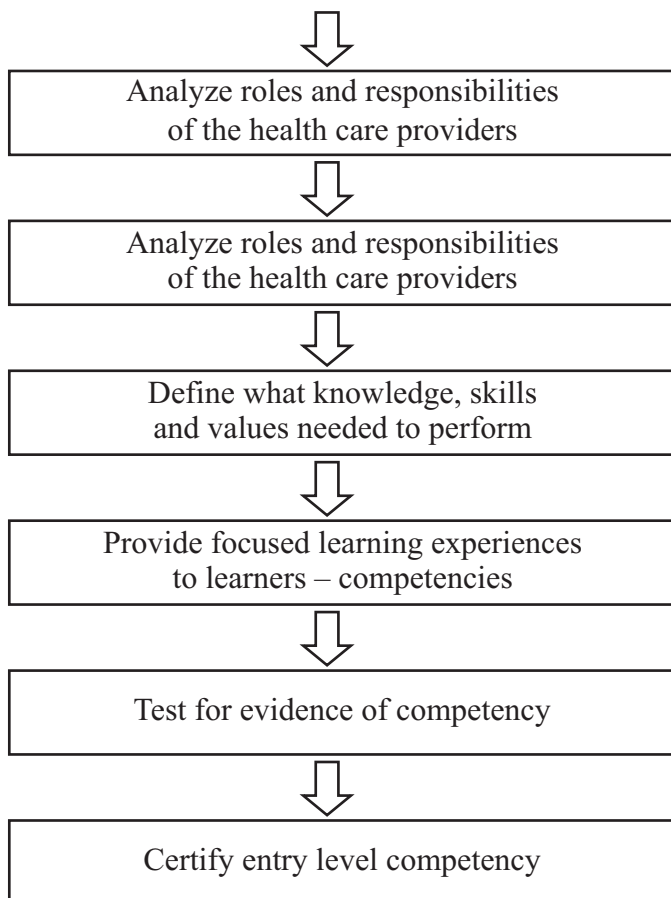
Education is a path—it is not the final destination.<sup>32</sup> It neither means carrying a baggage of knowledge or skills as arsenals in the quiver. Competency refers to a strategic location on this path where the learner is found to have the minimal knowledge, skills and values to practice independently in specific context or contexts as determined earlier. The learner has to manage a consistent and a continual growth. It is the point where responsibility for learning is transferred from teachers to learners. Competency continuum initiatives have been implemented by a number of educational establishments.<sup>33</sup>

## Competency Based Curricula – A Top Down Planning Approach

CB-Curricula are generally developed by top down approach. In this approach faculty start with well validated competencies as required for an entry

level practitioner and the model moves backward to performance based learning activities which enable student preparation for independent practice.<sup>34</sup> This provides scope for integrated learning which is holistic. This model can work effectively when a strong centralized curriculum management committee is established to keep a vigil on curricular delivery.

Grussing used the term '**Top-down planning**'<sup>35</sup> to imply that the roles, responsibilities and commonly performed tasks of practitioners while addressing the health care needs of public provide enough inputs to develop competency based curricula. According to this model public's health problems and the roles, responsibilities of the care providers form the 'TOP' of the model and curricular planning begins there and moves subsequently down with learning activities designed to certify entry level practitioner. As this model hinges on needs of population it is also called needs based curriculum.



**Diagram . 3.**  
**Showing Top-down Curricular Plan Model**

The bottom up approach is exactly converse to top down approach. It is used in 'Discipline based curriculum'. This is precisely the reason why the learners passing through this curriculum do not often match the expected requirements. Members of health professions education are more familiar with only bottom-up planning,<sup>36</sup> since it is in vogue for many decades in higher education.

Competency based education and curriculum are tested in dentistry,<sup>37,38</sup> nursing, physiotherapy and certain allied sciences also. Despite substantial research revealing effectiveness of CBME there are researchers who do not favour CBME. There are merits and also demerits of CBME.

### **MERITS OF CBME**

- 1. A new paradigm of competence:-** Provides a new discourse on what is meant by a physician's competence.
- 2. Customized clinicians:-** They are of high utility and it is in approval with social accountability.
- 3. Integrated learning:-** CBM-E promotes vertical and horizontal integration of disciplines and sub-disciplines. The learning is more meaningful and it is of utilitarian value.
- 4. Learner centred curricula:-** Flexible time frame, allows learner to progress at his own pace and focus is placed on learner's development.
- 5. De-emphasising rigid time schedule during learning:-** 'Each one at his own pace'---is the flexibility allowed in the curriculum. Time becomes a resource and not a marker of learning.
- 6. Easy portability of training:-** It eases the movement of health care providers across the jurisdictions.
- 7. Acts as glue to curriculum:-** It prevents fragmentation of curriculum. The learner is not kept in dark about what is expected of him at each phase.
- 8. Promotes Self-directed learning<sup>16</sup>:-** A higher order learning at professional education. As the competencies and ways to achieve them are explicitly stated learners can engage actively in self-directed learning.
- 9. Flexibility<sup>16</sup>:-** The structure and process both are flexible. Leeway is provided for certain desired changes in the curriculum.
- 10. Participation in curriculum planning<sup>16</sup>:-** It allows integrated teaching and learning along with

collaboration between different disciplines. This gives scope for all stakeholders to participate in curriculum planning.

**11. Tool for curricular evaluation<sup>16</sup>:** - Outcomes provide a set of standards against which curriculum can be judged.

**12. Continuity of education<sup>16</sup>:** - By stating the competencies need to be attained at a given phase, it provides eternal scope to continue education.

Competency-based education is fundamentally a very different method or approach in education. It is a relatively newer innovation and institutionalisation of such reforms proceeds through following steps<sup>39</sup>:-

Denial → Resistance → Acceptance → Bargaining  
→ Exploration → Commitment → Comfort

**Are our institutions ready to innovate?? At least are they ready to apply and check a recent innovation namely CBME ???**

The behavioural, political, economic, sociological, and cultural background needed for such an enterprise has to be studied in detail. Community as primary stakeholders constitute the focus in CBME because they are the end-users. It is said that curricular changes should be marked by more opportunities for community-oriented training and problem based learning with an integrated approach. Competency-based curriculum has all these attributes. Even post doctoral programmes with community based clinical care settings have been developed where competency continuum initiatives have been implemented.<sup>40</sup>

### Conclusions

Presently society is growing in awareness about the rights of its members. Every member of society has the right to receive care from a competent health care provider. Producing such competent health care manpower is the integral duty of our health care education system.

Competency-based medical education offers a ray of hope to meet the need for quality health care. Although CBME has some demerits as pointed out earlier, it has the potential to generate a product which is need based, custom made and competent. A professional, graduating through CB-Curriculum may be considered as a tool that will perfectly fit into the slot (needs). There is nothing wrong in expecting good results out of such a good fit. As CB-Curriculum's focus is not

on 'Inputs' but on 'Outputs' the gap between theory and practice will be bridged and it is for the benefit of the society.

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