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Process of Curriculum Development and Problem Identification in Pakistan

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1. INTRODUCTION

Process of curriculum development is essential for successful achieving educational goals for medical students. It asks for systematic approach which should respect several aspects: the needs of patients, of the society, the students and teaching staff. This process should be maximal efficient and effective; it should be built upon previous work. Process itself should be done in a specific algorithm starting from the definition of final goals of the educational process, through the selection of the certain tools for achieving this goals, and integration of different elements inside one curriculum. Curriculum should present mosaics of different courses, learning and teaching strategies, and integrate it into one picture which is specific for a certain institution. It has to respect all existing material and human resources of the institution.

Involvement of the key subjects in process of curriculum development should be from the first stage of process, and that

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first stage is creation of a mission statement of the institution. The student is the central figure in the process of education and modern education institutions use "student centered approach" as their main philosophy in process of curriculum shaping. Students should be involved in process of design and curriculum development. Representatives of students and their organizations should be involved in work of comities and bodies in charge for curriculum design. This fact that students are involved in shaping of their learning gives special quality to education process.

All stakeholders of institution should be included in process of curriculum development, and they all should give their view of the reasons why the institution exists. The mission statement should partly give sort of picture, what kind of graduated student do we want.

Curriculum development in medical education is a process that integrates a content area with educational theory and methodology and evaluates its impact. When curriculum development follows a systematic approach, it easily provides high-quality evidence of the impact of a faculty member's efforts in order to improve educational process at the institution.

One of the basics of curriculum development is the continual improvement of the outcomes the analysis of the processes and the decision to change.

Perhaps one of the possible ways is to measure key outputs of one curriculum. We can measure several outputs such as: physical aspects, social aspects, interpersonal skills, continuing education, clinical problem solving, student satisfaction, costs of education. It is essential to estimate when is appropriate time for measuring of these outputs, whether it is during studying time, at the end of it, at early beginning of career as physician or after several years. Tools for measuring must be carefully selected. Curriculum is not something static, and permanent change is one of their key features.

2. ELEMENTS OF CURRICULUM

Curriculum in narrow view includes content and examination. In wider frame curriculum includes aims, learning methods and subject matter sequencing. Broader concept of curriculum describes it as a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and the program of work.

Curriculum not only covers the formal teaching/learning but also the other aspects of human development associated with institutional life. It will transform a student into a productive citizen.

In the time of information explosion, the curriculum planners must not only decide what should be taught but also what can be eliminated from the curriculum, hence the need to define minimum essential knowledge and skills i.e. core knowledge and skills.

The term curriculum is a Latin word meaning "the course of a chariot race" (Schubert, 1986). Traditionally curriculum included two elements: content and examination (Harden and Stamper, 1999). According to Burton & McDonald (2001) it is difficult to provide a simple dictionary definition for this term because of its complex nature. Simply it can be considered as the list of topics taught in the school or in an institution. In wider view it encompasses all the experiences that the student undergoes through while being part of that institution.

Strength of the curriculum is beyond the written documents produced by the faculty.

Harden et al. (1997) said that a curriculum should be viewed not simply as an aggregate of separate subjects, but rather as a program of study where the whole is greater than the sum of the parts. According to Garcia-Barbero (1995)

curriculum is the result of bringing together a number of elements - content, strategies and methods – to ensure quality in education and excellence in performance, but should have a right mix of elements to ensure efficiency and to facilitate learning. Harden (2001) has elaborated on this concept "a curriculum is a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and the program of work".

Barnett (2000) states "curricula in higher education are to a large degree 'hidden curricula'… They take on certain patterns and relationships but those patterns and relationships will be hidden from all concerned, except as they are experienced by the students".

Curriculum should force learning process which is as similar as possible to professional activities (Garcia-Barbero, 1995).One way is to deliver instruction simultaneously in an integrated fashion e.g. teaching basic sciences in the clinical context along with psychosocial and ethical issues integrated into the cases (Miller et al., 2000).

The curriculum is a coherent unit of planned activities that are undertaken by a learner during his entire learning career under the coaching of the university. The curriculum indicates what objectives must be achieved by the student and what tasks must be fulfilled in order to achieve these.

A curriculum always primarily relates to an entire study program and consists of course subjects and possibly groups of course subjects. Traditionally content has always been considered the most important and relevant component of the curriculum.

Course is a subset of a program of study (equivalent to a module or unit of study). Academic staff, in collaboration with support staff, has the expertise to design and deliver courses based upon knowledge of student's needs. The design of course

should be done through very specific institutional procedures. The each faculty should poses clear, documented procedures for proposing, planning, internal approval, and validation of course, involving external and internal peer judgment. The Faculty Regulations provide the framework for course design.

Outcome-based education and a performance-based approach help to process of curriculum development in a way that offers a powerful and appealing way of reforming and managing medical education. The emphasis is on the product - what sort of doctor will be produced- rather than on the educational process. In outcome-based education the educational outcomes are clearly and specified. These determine the curriculum content and its organization, the teaching methods and strategies, the courses offered, the assessment process, the educational environment and the curriculum timetable. They also provide a framework for curriculum evaluation. It encourages the teacher and the student to share responsibility for learning and it can guide student assessment and course evaluation. What sort of outcomes should be covered in a curriculum, how should they be assessed and how should outcome-based education be implemented are issues that need to be addressed.

3. CURRICULUM DEVELOPMENT PROCESSING

According to Kern it is possible to use a six-step approach to curriculum development for Medical Education:

3.1. Problem identification and general needs assessment

The most important step is the first one, the general needs assessment (GNA). The goal of step 1 is to focus the curriculum, by defining the deficits in knowledge, attitude, or skills that currently exist in practitioners and the ideal approach to teaching and learning these objectives. When completed, the

GNA makes a strong argument for the need for the curriculum and identifies potential educational research questions.

Research for this step can extend over many fields of endeavor: public health and epidemiology, health care systems, utilization and resources, emerging knowledge of disease, patient support groups, and educational theory and practice.

A well-researched step 1 impacts steps beyond the learner objectives by identifying educational methodologies, faculty development resources, potential funding resources, and opportunities for dissemination of the curriculum.

Identification and critical analysis of the health care problem that will be addressed by the curriculum requires substantial research to analyze what is currently being done by practitioners and educators, i.e., the current approach, and ideally what should be done by practitioners and educators to address the health care problem, i.e., the ideal approach. The general needs assessment is usually stated as the knowledge, attitude, and performance deficits that the curriculum will address.

3.2. Needs assessment of targeted learners

The general needs assessment is applied to targeted learners. What kind of doctor do we want to educate it depends mostly on social needs but it can reflect job opportunities, financial rewards and attitudes acquired during process of studding. Sometimes it is very difficult to make balance between these several needs. Needs can be obtained on different ways. It can be done through study of errors in practice. It is very difficult to design curriculum which will fully meet the needs of society and students. Following picture present the relation between needs of different subjects. Expectations of society from graduate students are view from one perspective. For example, according to the European Qualifications Framework graduate students should possess following performances:

- The descriptors

- Knowledge and understanding
- Application of knowledge and understanding
- Ability to making judgments
- Ability to communicate
- Learning skills
- Level depending on the cycle

If we ask students what they expect from their knowledge after graduation we will probably get another list of expectations.

Curriculum of medical faculties must be designed on the way which can provide performances after the student graduation asked from society but from student as well.

At the base of the general needs and needs of targeted learners should be made essential documents for every institution, the mission statement. Mission statement can include just generalized reasons for existing of institution, but it can be more concrete and include several aspects of student's knowledge like: theoretical knowledge, skills, performances etc. The mission statement should partly give sort of picture, what kind of graduated student do we want. Involvement of the key subjects in process of curriculum development should be from the early stages of process of curriculum development, and one of the first steps is creation of mission statement of institution. All stakeholders of institution should be included in this process, and they all should give their view of the reasons why the institution exists.

In the process of defining of mission statement for medical institutions, it is recommendable to include all stakeholders such as: representatives of ministries of health, health care institutions accrediting agencies and scholarly societies and ministries of education. Stakeholders will ensure: financial, political and all other support which mission ask for in the process of implementation of new one or reformed curriculum. Some authors propose strong relationship with

other educational institutions that are similar in certain aspects with the institution which try to define its mission.

Mission of B&H medical faculties covers following areas:

I Teaching
II Research
III Medical services and health care
IV Role in society health care

3.3. Goals and objectives

Institution should define overall goals and aims for the curriculum. Specific measurable knowledge, skill/ performance, attitude, and process objectives should be stated for the curriculum.

Learning goals and outputs for every course and subject should be compatible with mission of institution. It means that achieving of learning goals of different subjects and courses will lead to reaching mission of institution at the end of student studding process. Planning of new curriculum and reform of old one asks for defining of philosophy which is ` behind ` the curriculum and all its elements. Learning goal and outputs should also determinate the educational philosophy and institutional culture. So, mission of institution, educational philosophy and institutional culture are key elements of educational settings necessary for curriculum implementation.

An aim indicates the direction or orientation of a course in terms of its content. An aim is written in terms of level, teaching intentions and management of learning. The aims of the course encapsulate the purpose of the course and what the institution trying to do in providing the course. Aims are therefore more about teaching and the management of learning. Learning Outcome is an expression of what a student will demonstrate on the successful completion of a course. Learning outcomes are related to the level of the learning; indicate the intended gain in knowledge and skills that a typical student

will achieve and should be capable of being assessed. Learning outcomes are more about the learning that is actually to be achieved by the learner. Outcomes ten formulated as competences. The outcomes are coherent with the educational vision. These objectives make it also clear to the student what may be expected of the course.

The aims and learning outcomes of a course should determine the choice of teaching processes through which the module is presented. The teaching processes should be matched to the processes required of the student in attaining the intended learning outcomes of the course. Since a course will normally have several intended outcomes, different components of the course will be suited to different teaching and learning processes, and such a course should be presented through a variety of appropriate methods.

(Educational) objectives are the end qualifications that are aimed to be reached by the student at the end of the study program. Curriculum is in continuous process of tuning objectives to the expectations of external actors (stakeholders) and internal actors (clients)

Tuning of curriculum and objectives clarifies which course subjects or which groups of subjects contribute to the different objectives.

- It is an instrument to make sound decisions for the learning environment.
- It is an instrument for evaluating subjects reliably.
- Students can derive from the objectives what they may expect from a study program; the list of objectives guides their studies.

CATHALOGUE OF LEARNING SKILLS AND OBJECTIVES

Very important step is identification of attributes expected of medical graduates. Once these attributes are identified,

educators must translate them into meaningful learning objectives.

It is recommendable that every medical school has a catalogue of skills and knowledge, the document where all the theoretical and practical knowledge which student should have after graduation is listed. This document is based on mission statement of institution and it is derived from the learning goals and outputs of all courses inside curriculum.

3.4. Educational strategies

It is necessary to make a plan how to maximize the impact of the curriculum, which content should be included, how content should be organized and with which educational methods, how elements of curriculum should communicate, what kind of educational environment and climate should be developed. Content which is included must provide to student critical thinking. It must be selected and organized on the way to initiate critical approach to facts and development skill of information retrieval.

Document with the objectives, should be prepared in advance. Content of certain courses should provide better understanding of other subject, for example anatomy and physiology, radiology and anatomy etc. Position of each course is one of the aspects which should be analyzed. Mostly at the first study years basic sciences are taught and they provide continuation of studying with clinical subjects. Some models of curricula prescribe modules as organizational unit which includes knowledge starting from basic science and anatomy and physiology till patho-physiology, clinical diagnostic and treatment. New trends in modern education show signs of introducing an early contact of students and patients in the curriculum, and thus courses such as introduction in clinical practice have among the others the best possible preparation of medical students for studying clinical subjects etc.

Some possible educational strategies:

Student centered/ teacher centered

Student centered strategy ask for active role of student in process of definition of curriculum, decision about learning methodology and decision what and when they will study. Second strategy is based on teacher decisions what, when and how will certain subject be studied.

Problem solving/ information gathering

Problem solving strategy is based on student acquiring of knowledge through process of clinical problem solving. Information gathering is a strategy based on student presentation of gathered information.

Integrated multidisciplinary approach

This strategy is based on integration of different disciplines. Mostly integration is made around certain organ systems. Basic sciences, preclinical and clinical subjects are integrated around the organ system which they studied.

Community based/ hospital based

Community based teaching is educational strategy based on studying in community health centers, while in hospital based strategy educational process is based on hospitals which represent teaching base for faculty.

Elective/ standard

In elective strategy studying process is organized on the way that all students have the same core curriculum while they choose certain aspects which they want to study more deeply through elective courses. In standard curriculum all students have same curriculum without possibility to choose elective subjects.

Systematic planned/ opportunistic

In systematic approach teaching and learning experience are planned. In opportunistic approach student follow the experience of departmental doctor as it is.

3.5. Implementation

A plan for implementation, including timelines and resources required, should be created. A plan for faculty development is made to assure consistent implementation.

Management of curriculum implementation

Clear responsibility of certain bodies, comities and individuals should be one of key elements in the process of curriculum implementation. Role of the students in process of curriculum management should be clearly defined. The committee for coordination among courses in order to synchronize objectives of courses and overall curriculum should be established. Clear feedback on customer requests should be defined.

Teaching environment

Very important aspect of successful implementation of curriculum is teaching environment and fact whether the atmosphere inside the institution is encouraging for the people with ideas, initiatives and cooperation among students. It is desirable to establish a sort of "department of curriculum development". The role of this department should be strengthening and expanding of faculty and curriculum development programs at the medical school and its clinical affiliates, with the purpose of enriching and advancing the school's educational mission. It should play a key role in the educational activities of the medical school, it works in collaboration with faculty to design, implement, and assess new courses, innovative teaching methods, and distance learning and educational technology initiatives. This department should provide programs in numerous aspects of classroom and clinical

teaching, so that faculty can expand their knowledge base in education and enhance their teaching skills; develops workshops and seminars upon faculty request; assists individual faculty who would like to improve their teaching; and provides faculty with consultation on and assistance with projects in medical education

3.5.1. Relation between departments

One of the obstacles which may occur in process of curricular change is organizational structure of institution. Too much independent departures with huge level of autonomy can be problem in case that we want to implement curriculum which ask for strong inter-relations and cooperation's among departments. Sharing of financial and all other funds which are available for the curricular reform can be one of the reasons for misunderstanding between departments. It has been found that strong collaboration among departments is one of the preconditions for successful curricular reform. Possible reason for that might be better flow of information and ideas among departments. New modern curricula ask for interdisciplinary approach in curricular reform and from that reason it is very important to have departments which are more oriented to collaborative approach.

One of the key problems which may occur is the process of extension of one course and its size in comparison with others. This problem is evident in the time of fast enlargement of medical knowledge what gives possibility for uncontrolled growth of subjects. To solve this problem it is necessary to put learning goals of subject into context of mission of overall institution. An additional aspect which has to carefully plan is vertical and horizontal coherency of subjects and flow of student existing knowledge among them.

3.5.2. Organization of course

Organization of courses inside curriculum must be done in accordance with the needs which are derived from the mission statement of the institution.

Finding of appropriate ratio between different subjects in aspects of time and quantity of number of lessons and exercises is a special problem. The ratio between theoretical and practical teaching should be made in that way that final student knowledge is the highest possible level of the Millers pyramid of knowledge. According to modern trends in education and following by certain suggestions in Bologna declaration it has to be 60% of practical, and 40 % of theoretical work.

Special accent is put into integration of different courses inside curriculum. The vertical and horizontal curriculum coherency of the course must be provided. By integration we mean that the position of certain course inside curriculum is very precisely determined. Its position is based on the student previous knowledge, and it should make student able to follow the teaching process on other courses at the same academic year. Student learning achievements at the end of certain course should make student able for the following of the teaching process at the next academic year. Overlapping between medical courses in term of same learning objectives should be minimized.

The criteria for selection of course contents are often complex due to involvement of different factors like interests of people planning the curriculum or the influence of the different departments in the institution (Alshehri, 2001).There is a tendency to add and a resistance to reduce or replace the previous topics in the contents of core curriculum (Zakrzewska et al., 2003) as reduction in content may compromise the resources, financial support and power

"There is a persevere drive towards an unrealistic degree of completeness in the curricula reinforced by the

reluctance of departments to lessen their teaching time and of teachers to shorten their course content" (GMC, 1993).

Definition and organization of the course inside curriculum include:

- Defining of requirements for attending of teaching process from particular course
- Course content
- Class timetables of contact hours,
- Learning and teaching methods
- Course credits and student workload
- Schedule of examinations, structure of examination,
- Compulsory and optional course elements
- Details of each component course, include:
- Learning outcomes,
- Objectives, syllabus,
- Assessment criteria,
- Reading lists (essential and background).

The problem of curriculum implementation is even more complicated in elective education strategy.

As the core content is a relatively new idea in medical education, there is no consensus on the method of selecting the knowledge, skills and attitudes to be included in such a curriculum. One of the key problems in this strategy is how to identify what constitutes the core curriculum. Some of the methods are documented by Kemahli et al. (2004) reporting the process of identification of core curriculum for their faculty at the Ankara University. They started with the formulation of mission and vision statement, and the aims and objectives of the departments as well as undergraduate curriculum. Initially they identified the core clinical topics that a doctor at graduation is supposed to know using their specified criteria. Clinical and basic science knowledge, skills and attitudes were then specified for these topics again using check criteria.

According to Rolfe et al. (2002) the process of identification of the core curriculum should be in cooperation with range of stakeholders. First it should be identified the list of core clinical conditions identified from literature following by refined list by consulting directors of clinical training, faculty, nurses, registrars and interns. Finally a list was produced in respect to four levels of skills which at each condition should be managed by the interns: theoretical knowledge, recognizing of symptoms and signs; preliminary investigations, management and/or treatment; total investigation, management and/ or treatment.

Haddad et al. (1997) discuss the dilemma of criteria for the selection of a topic as core- what should be included and why as core? Initially they agreed on the basic terms of reference: to aim at knowledge level appropriate for GP/casualty officer; to maintain system-based approach; to follow a problem-oriented approach; to adopt the grid structure as an expression format. After that they set the criteria for a topic to be considered as core. For example: it is common; has serious impact on health; has a screening program; can be study model of certain concepts; is of ethical or legal importance; has local flavor; and is of future importance. They also classified the knowledge into 5 levels; know that a thing exists; know to which group it belongs; think of it as a possibility; know how to confirm the condition; know what to do about the condition; know all the details.

3.5.3. Teaching Methodologies

Teaching methods for certain course must be carefully selected. It has to provide to the students although having different habits the same possibilities for adoption of the knowledge. The methodology must be suitable to provide life-long learning and the capacity for the application of student's knowledge in the practice. Methodologies can be selected according to the human and technical capacities of the institution. It has to respect educational philosophy of the institution. Modern educational

institution follow student centered approach in their philosophy.

Teaching methodologies must provide the "active process of learning. When we want to implement new curriculum we have to reconsider two main questions related with good settlement of teaching methodologies:

size of the student group
which teaching tool should we use

Size of the group can be influenced with learning objective and some of the objectives are more achievable in the small group while other ones can be reached in large groups or in the individual work. Limits of the space and number of staff can be the facts which can prevent such approach. Combination of work in large and small groups can be used.

Finding suitable technical tools which are the most suitable for certain learning goals is second important issue. These tools should offer student possibility to choose tool, time and place where to learn. Certain tools can be used in some particular context, but mostly all tools can be used in all settings. Using of different tools depends on course objectives, technical possibilities of institution and possibility of staff to use certain technical equipment. Variety of teaching tool such as: computers, slides, posters, videotape, audiotape, cameras, simulators, patients should be available to teaching staff but to students as well. Certain teaching tool can be more suitable for work with some particular size of the group for example computers can be used for individual work. Combination of using of teaching tools can be used for teaching units. Free choice of student election of teaching tool according to his wishes would be ideal for success of teaching process.

Teaching is a demanding and complex task. Implicit in the widely accepted and far-reaching changes in medical education is a changing role for the medical teacher. Twelve

roles have been identified and these can be grouped in six areas in the model presented:

1. the information provider in the lecture, and in the clinical context;
2. the role model on-the-job, and in more formal teaching settings;
3. the facilitator as a mentor and learning facilitator;
4. the student assessor and curriculum evaluator;
5. the curriculum and course planner; and
6. the resource material creator, and study guide producer.

As presented in the model, some roles require more medical expertise and others more educational expertise. Some roles have more direct face-to-face contact with students and others less. The roles are presented in a 'competing values' framework- they may convey conflicting messages, e.g. providing information or encouraging independent learning, helping students or examining their competence. The role model framework is of use in the assessment of the needs for staff to implement a curriculum, in the appointment and promotion of teachers and in the organization of a staff development program. Some teachers will have only one role. Most teachers will have several roles. All roles, however, need to be represented in an institution or teaching organization. This has implications for the appointment of staff and for staff training. Where there are insufficient numbers of appropriately trained existing staff to meet a role requirement, staff must be reassigned to the role, where this is possible, and the necessary training provided. Alternatively, if this is not possible or deemed desirable, additional staff needs to be recruited for the specific purpose of fulfilling the role identified. A 'role profile' needs to be negotiated and agreed with staff at the time of their appointment and this should be reviewed on a regular basis.

The role of performance assessment in outcome based education is one of the most important. Issues of the relevancy

of assessment to student learning are highlighted in the context of outcome-based education. It is desirable to prepare implementation guidelines of assessment programs in outcome-based education due the fact that these assessments are key features of such programs.

3.5.4. Human resource development

In order to implement successfully new curriculum or reform old one it is essential to have staff trained who will be main force in curriculum implementation. Instruction should scan and predict special human needs in sense of qualification and knowledge necessary for better efficiency in their work. People like to feel self/respected, self accomplished, safety and that's the way the new requests are appearing in new curriculum. Staff needed, can be different depending on the nature of innovations in curriculum? Staff training should be an ongoing process. Training should be opportunity for staff to discuss about many problems and aspects of curriculum implementation. Leadership skills training is special aspect of this human development training programs. Leaders are necessary for promotion of new systems of values, educational philosophy. They have to mobilize other human resources to maintain the curricular change momentum.

3.6. Evaluation and feedback

Evaluation of curriculum presents the final stage inside cyclic process of improvement and development of curriculum.

Without evaluation procedure it would be hard to imagine monitoring of institution progress toward desired needs. This process is necessary to provide the evidences that institution made a step in the right direction, as well as useful information to stakeholders. It helps in the process of identification of problems inside curriculum and institution, solving of problems and redesigning of certain aspects of curriculum. Evaluation can be performed as short-term and

long-term evaluation. Short-term evaluation has a role of "friendly" criticism, while the long term evaluation is a crucial one, with much deeper impact. Department for quality assurance is usually in charge for conducting of such procedures and it is up to them to decide about many aspects of this process.

Evaluation of curriculum can be made through evaluation of many different aspects as:

- Psychological and interpersonal skill
- Continuing learning
- Professional satisfaction
- Practice behavior
- Educational achievement and cognitive development
- Institutional issues
- Student passing rates
- Making of clinical mistakes
- Clinical problem solving
- Educational cost per student
- Cost efficiency of graduates as practitioners

It is very important to carefully define the appropriate time for evaluation for each of these areas as well as the methods for its measuring. Evaluation will only have full meaning if it is followed by action in order to improve areas which are estimated as weak points of curriculum. This action is obligatory for relevant bodies and management structures and should be described precisely inside document policy agreement.

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