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Determining the future direction of Curriculum reform process at a Public-Sector University in Saudi Arabia.

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Abstract:

Introduction: Educational institutions have recognised the importance of evaluating academic curricula to keep up with dynamic changes in the field of medical education. The college of medicine at King Khalid University has acknowledged this trend and embarked on reviewing its curriculum.

Objectives: To evaluate the undergraduate medical curriculum using SPICES model of curriculum evaluation as a tool with the view to plan and shape future curriculum reforms at the college of medicine, King Khalid University.

Methodology: A questionnaire-based survey was conducted eliciting the responses of faculty members and the departmental chairmen regarding the practice of student centred, integrated and non-traditional teaching methods as well as a separate questionnaire for the quality of problem-based learning in practice. The compiled responses from all the respective departments were statistically analysed subsequently.

Results: An average of 43.5% of student-centred learning (SCL), 41% of Integrated teaching (IT) and 19% of Non-traditional teaching (NTT) is being employed in different departments of the college of medicine.

Conclusion: The results suggest that the college of medicine is currently carrying out traditional teacher centred, discipline based and information-oriented teaching along with small chunks of student centred, integrated and problem-based teaching methods. Although the problem-based learning is proportionately very small in practice but in general, its quality is better in the clinical departments as compared to the basic sciences departments.

Key words: Curriculum evaluation, curriculum review, medical education, educational strategies

Introduction:

Educational institutions have recognised the importance of evaluating academic curricula to keep up with dynamic changes in the field of medical education. The college of medicine at King Khalid University has acknowledged this trend and embarked on reviewing its curriculum in April 2016. Great strides in curricular reform have been introduced into many medical schools since the presentation of the SPICES model by Professor Ronald Harden at the University of Dundee in 1975. The SPICES model is a tool for the curriculum development and evaluation. It has been adopted widely in curriculum planning and evaluation around the world. Since curriculum is the sophisticated blend of educational strategies therefore, this model presents the curriculum in the form of educational strategies. The SPICES model comprises of six

(6) educational strategies related to the curriculum in a medical school. Each of these strategies is presented as a spectrum or continuum. On the left extreme, are the more innovative approaches (SPICES) whereas on right are the more traditional strategies. Although the issues are interrelated but there is a great advantage in looking at each issue separately as this will permit us to know about the current standing on the spectrum. Educators or teachers find it helpful to identify where on the SPICES continuum they locate their current teaching practice and where they would like their curriculum to aim.

The educational strategies:

Student-centred learning ← → *Teacher-centred learning*

Student centred learning features as one of the six educational strategies described by Professor Harden in the SPICES model, each strategy presented as a continuum between two extremes. In the case of Student-centred learning, the extremes are Student centred learning and Teacher centred learning. In a student-centred approach to the curriculum, the students must take more responsibility for their own learning. The emphasis is on the students and on what and how they learn. In contrast, in a teacher-centred approach, the emphasis is on the teachers and on what they teach¹.

Integrated teaching \longleftrightarrow *Discipline based teaching*

Integration is the organisation of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments². Integrated teaching features as one of the six educational strategies by Professor Harden in the SPICES model, each strategy presented as a continuum between two extremes. In the case of integrated teaching, the extremes are integrated teaching and Discipline/Subject based teaching.

In the traditional discipline-based curriculum the teaching emphasizes the classical disciplines such as anatomy, biochemistry, pathology, community medicine, and surgery. In the traditional curriculum we have the building block principle in which each subject has its own block of time and is usually restricted to one part of the course. The early curriculum subjects are expected to lay foundation for those subjects that follow. It is left to the students to put together the knowledge gained in each discipline into an overall picture of medicine. In the past two decades, more emphasis has been put on the teacher taking responsibility for this integration and on bringing the subjects together, so they are presented to the students as a meaningful whole. Integration may be round systems².

Integration may be described as horizontal integration or as vertical integration. Horizontal integration is integration between parallel disciplines, i.e. disciplines such as anatomy, physiology and biochemistry. Vertical integration is integration between disciplines traditionally taught in different phases of the curriculum such as anatomy and surgery².

The Integration ladder is devised by Professor Ronald Harden and it can be used as a tool to assist curriculum evaluation and to evaluate the level of integration in a curriculum. It has eleven steps from discipline/subject-based to integrated teaching and learning. In the first four steps on the ladder, the emphasis is on the subjects or disciplines. Moving up the ladder, the following six steps emphasize integration across several disciplines. In the final step, the student takes more responsibility for the integration and is given the tools to do so. As one moves up the integration ladder there is less emphasis on the role of the disciplines in the curriculum, an increasing requirement for a central curriculum organisational structure with appropriate resources at its disposal, and a requirement for greater participation by staff in curriculum discussions and planning. The higher up one goes on the integration ladder, the more important is the communication and joint planning between teachers from different subjects.

Agreement between departments may be required concerning the outline of the teaching programme, the sequence of the teaching, the aims and objectives of the programme, the details relating to content and the method of student assessment².

Problem based learning \longleftrightarrow *Information oriented learning*:

Problem-based learning features as one of the six educational strategies by Professor Harden in the SPICES model, each strategy presented as a continuum between two extremes. In the case of problem-based learning, the extremes are problem-based learning and information-oriented learning. The emphasis in many undergraduate medical education programmes has been on imparting to students a large body of basic science and clinical knowledge. Once qualified, students are expected to be able to synthesize this information and apply it to the care of their patients. There is, however, a growing body of thought that this type of undergraduate programme does not prepare students adequately for their career as doctors and that it is insufficient as a method of learning². In a problem-based learning approach, students tackle patient problems, health delivery problems, medical science problems or research problems. These act as stimulus for learning in the basic sciences or clinical medicine¹.

Non-traditional teaching methods mean methods other than didactic lectures and practical (inclusive of anatomical dissections). This includes small group teaching methods like tutorials, seminars and buzz groups in which problem-based learning is being practiced.

Objective:

The objectives of this study are:

1: To evaluate the curriculum of the College of Medicine with respect to the SPICES model for curriculum evaluation in the following areas:

- Student Centred learning vis-à-vis Teacher Centred learning
- Integrated teaching vis-à-vis Discipline based teaching
- Problem based learning vis-à-vis Information oriented approach

2: To evaluate the problem-based learning being practiced in the departments of the college of medicine with reference to its quality.

Methodology:

The curriculum evaluation was planned to be carried out in the College of Medicine, King Khalid University, Abha, during April-May 2016. The stages taken during the process were described and analysed. The approach was a participatory one where by the planning was done through a series of committee meetings which were headed by the dean himself. The Medical Education Development Centre focused on developing standardized questionnaires for evaluation of pre-clinical courses or clerkships which were sufficiently general, so as to apply to all courses in its domain but sufficiently specific to provide useful, interpretable information. Three questionnaires were prepared for curriculum evaluation to elicit the subjective graded responses of the faculty members and the departmental chairmen in the college of

medicine. These were constructed consulting different guides and published literature on Medical Education such as the 'Association for the study of Medical Education (ASME) booklet number 18 on SPICES model', 'Integration ladder', 'Problem-based learning- a practical guide', 'the PBL continuum' and the 'tutorial process'²⁻⁶. The above three questionnaires were thereafter mailed electronically to all the medical education committee members and were approved unanimously to be used for evaluation purposes in the subsequent days.

Inclusion criteria

The inclusion criteria were decided upon as follows:

The ten (10) departments from the College of Medicine were included in the evaluation.

Chairmen and course co-ordinators for the medicine course only from the above-mentioned departments were included.

Exclusion criteria

The exclusion criteria were decided upon as follows:

Department of Pharmacology was not to be included in the evaluation.

Co-ordinators of courses other than the college of medicine were not to be included.

A visit to each of the department was then organized and the interviews were conducted by the author. The compiled responses from all the respective departments were statistically analysed subsequently. The graded responses gathered from the faculty members were converted to a percentage format for the purposes of calculation of weighted average values. Correlation was established between the responses of course coordinators and the departmental Chairmen.

Results:

A total of 35 questionnaires were filled in during this evaluation by 10 Chairmen and 25 course co-ordinators from the college of medicine. Careful scientific statistical analysis has been applied to all the observations in order to reveal the salient features.

An average of 43.5% of student-centred learning (SCL), 41% of Integrated teaching (IT) and 19% of Non-traditional teaching (NTT) is being employed in different departments of the college of medicine. Few departments like community medicine, physiology and pathology are practicing more student-centred learning. Physiology, Microbiology, community medicine and Gynaecology/obstetrics are practicing more integrated teaching. Non-traditional teaching methods are generally not practiced in most of the departments with the few exceptions of surgery and medicine departments.

Table 1: Cumulative gross observations for the College of Medicine

| | |
|---|--|
| Student Centred Learning (SCL) (43.51%) | Teacher Centred Learning (TCL) (56.49%) |
| Integrated teaching (IT) (41.49%) | Discipline based teaching (DBT) (58.51%) |
| Non-traditional Teaching (NTT) (18.8%) | Traditional Teaching (TT) (81.2%) |

Table 2: Cumulative discipline-wise distribution of the responses (%) for Student Centred Learning, Integrated and Non-traditional teaching.

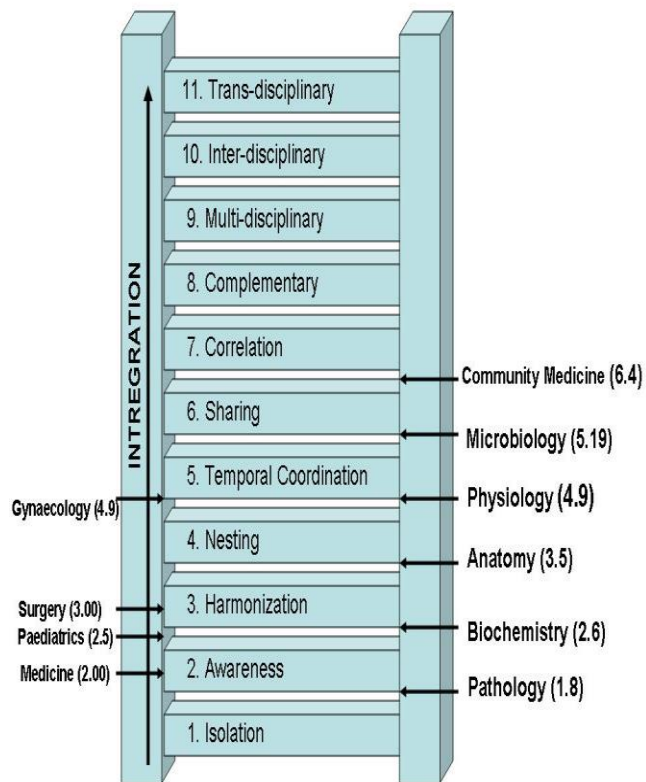
| Subjects | Student Centered Learning (%) | Integrated Teaching (%) | Non-traditional teaching (%) |
|--------------------|-------------------------------|-------------------------|------------------------------|
| Anatomy | 39.33 | 39.7 | 00 |
| Physiology | 52.5 | 54.82 | 11 |
| Biochemistry | 33.75 | 28.98 | 03 |
| Pathology | 49.44 | 20.12 | 11 |
| Microbiology | 40.55 | 57.77 | 16 |
| Community Medicine | 72.37 | 74.6 | 13 |
| Pediatrics | 41.11 | 27.77 | 20 |
| Surgery | 38.66 | 34.44 | 37 |
| Gynecology | 31.43 | 54.44 | 33 |
| Medicine | 36 | 22.31 | 44 |
| Grand Total | 435.14 | 414.95 | 188 |
| Average | 43.514 | 41.495 | 18.8 |

Table 3: Year and discipline-wise distribution of responses (%) for Student Centred Learning, Integrated and Non-traditional teaching.

| First Year | SCL | IT | NTT |
|-------------------------|---------------|-----------------|-------------|
| Anatomy | 39.33 | 39.7 | 0 |
| Physiology | 52.5 | 54.82 | 11 |
| Biochemistry | 33.75 | 28.98 | 3 |
| Total | 125.58 | 123.5 | 14 |
| Average | 41.86 | 41.16667 | 4.66 |
| | | | |
| Second Year | SCL | IT | NT |
| Pathology | 49.44 | 20.12 | 11 |
| Microbiology | 40.55 | 57.77 | 16 |
| Total | 89.99 | 77.89 | 27 |
| Average | 44.995 | 38.945 | 13.5 |
| | | | |
| Final Years | SCL | IT | NT |
| Community Medicine | 72.37 | 74.6 | 13 |
| Pediatrics | 41.11 | 27.77 | 20 |
| Surgery | 38.66 | 34.44 | 37 |
| Gynecology & Obstetrics | 31.43 | 54.44 | 33 |
| Medicine | 37.08 | 22.31 | 44 |
| Total | 220.65 | 213.56 | 147 |
| Average | 44.13 | 42.712 | 29.4 |

(SCL=Student centred learning; IT= Integrated teaching, NTT= Non-traditional teaching)

In this table, when we move from the 1st year towards the final year, it can be seen that the percentages of student-centred learning and Integrated teaching increases to small proportion but when we look at the percentages of non-traditional teaching year wise, it increases from 5% in 1st year to 14% in the 2nd year and almost 30% in the final year.

Figure-1: Department wise standing on the integration ladder

Discussion:

A curriculum is a dynamic process that needs to be reviewed constantly. There has been a rapid expansion of knowledge and a lot of innovations in medical education. Many medical schools in the world are in the process of reviewing their curricula⁷. Bearing all this in mind the college of medicine realised the need to examine the curriculum. The current project had to be completed within a specified period which definitely work as a stipulated time constraint.

This study shows that the percentage of non-traditional teaching methods is gradually increasing from the basic sciences departments to the clinical sciences departments with an average value of 18.8%. The highest in practice is in the department of medicine (44%) which is followed by the department of surgery (37%). This signifies that as we move from teaching of basic sciences to teaching of clinical sciences, non-traditional methods start to play their role significantly which is quite logical because later years of the medical course requires building of problem solving and critical thinking skills which is one of the main hallmarks of the non-traditional methods. As far as quality of problem-based learning is concerned, it is fine in departments of medicine and surgery (73.98% for medicine and 66.28% for surgery). It is indeed interesting that the other departments which are practicing non-traditional methods only minimally are also practicing a reasonable quality of problem-based learning in these sessions.

The average value of student-centred learning in different departments of the college of medicine is about 43.51%. Physiology and community medicine departments are the two which are currently practicing student-centred learning of more than 50% in their courses. This fine percentage is a very healthy notion for an institution which has currently no declaration of student-centred learning strategy as its educational philosophy. This also shows on the part of faculty that they are subconsciously more inclined towards this innovative approach of medical education which is desirable in context of higher education.

The average value of discipline-based teaching in different departments of the college is about 58.51% as compared to 41.49% for the integrated teaching. It is a strange finding for the integrated teaching because the author noticed that at the time of individual interviews with faculty members, it was ascertained that the perceptions of the faculty about the integrated teaching were not clear and many of the components of integrated teaching mentioned in the integration ladder are actually in practice without being their acknowledgement. Department of Pathology stands on the second step (low) while department of community medicine stands on the sixth step (high) of the integration ladder (see figure 1). From this study we come to know that where on each spectrum of SPICES model we are currently standing. The next step in the right direction is to decide through a participatory approach that where we want to see our college in the next couple of years and what type of educational philosophy we want to adopt in our curriculum. These important issues will shape the future strategy of our curriculum development and its innovation.

Conclusions:

1. The college of medicine at King Khalid University is currently following a curriculum which is pre-dominantly carrying out traditional teacher centred learning along with a proportion of innovative student-centred learning.
2. The college of medicine is currently following a curriculum which is pre-dominantly carrying out traditional discipline-based teaching along with a proportion of innovative integrated teaching.
3. The college of medicine is currently following a curriculum which is pre-dominantly carrying out traditional information-oriented learning along with a small proportion of innovative problem-based learning.
4. Although the problem-based learning is proportionately very small in practice but in general, its quality is better in the clinical departments as compared to the basic sciences departments of the medical college.

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