

Competency based undergraduate curriculum for the Indian Medical Graduate, the new MCI curricular document: Positives and areas of concern

Ananthkrishnan N

Sri Balaji Vidyapeeth,
(Deemed to be University),
Pillaiyarkuppam,
Puducherry-607402.

For Correspondence

*Dr. Ananthkrishnan N,

Email: n.ananthk@gmail.com

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ABSTRACT

The list of required competencies for the Indian Medical Graduate (IMG) along with suggested teaching / learning methods and topics for integration have been notified by Medical Council of India. Also, the desired level of proficiency for various competencies has been defined with emphasis on the need to certify some of them. The corresponding Graduate Medical Education Regulations with details of curricular time assignment for various disciplines, scheduling and details of the evaluation process are still to be released and is expected shortly. With implementation fixed for the academic year 2019-20, it is necessary for all faculty to be apprised of the details of the changes being sought to be brought about. This paper will focus on details of the new curriculum, its merits compared to the previous version and some areas of concern which may require attention and rectification later on. One possible strategy for preparing and implementing the curriculum by August, 2019 will be suggested.

Keywords:

Curriculum, competency based education, Indian medical graduate

INTRODUCTION

In 2011-12, during the tenure of the first set of Board of Governors for the Medical Council of India, a new vision document was prepared by a distinguished committee of senior teachers working for over one year. This was labeled the Vision 2012 document of the MCI on UG medical education. With minor modifications it was released as the Vision 2015 document but still remained unimplemented.¹ A modified and detailed version of the original document called “Competency Based Undergraduate Curriculum for the Indian Medical Graduate” has been released by the MCI recently during the tenure of the third set of governors. It is proposed to be implemented as the new curriculum with effect from the 2019-20 batch of MBBS students.² The released document largely pertains to the required competencies and the appropriate teaching-learning activities. Scheduling, subject-wise curricular time and details of proposed

evaluation are still to be released. Simultaneously the Attitude, Ethics and Communication (AETCOM) module of the MCI which is intended to be run as a core curriculum throughout the course with a clear definition of what constitutes an “Indian Medical Graduate – IMG” has also been placed in the public domain.³

The time is, therefore, optimum to review this document and highlight its significant positive recommendations and also focus on some residual deficiencies which may need to be corrected before implementation in the next academic year.

INTEGRATION IN THE NEW CURRICULUM

A welcome part of the new curriculum is the statement on the principles of integration. There is a lot of misconception in the minds of teachers and administrators of what constitutes

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integration. From the pedagogic point of view, integration is a means to an end, viz. better learning. It should, therefore, be promoted only when it leads to a better comprehension of the subject, a greater understanding of the relevance of the topic in the context of future practice and enables better problem solving. Forced integration when the above conditions are not met is likely to lead to poor outcome as far as results of the summative examinations go. Also, integration beyond a certain level without altering the evaluation pattern becomes meaningless as there is a mismatch between the teaching learning content and the valuation pattern.

These principles have been recognized in the new curriculum. It is suggested that integration should not exceed 20% of the total curriculum at recommended levels. A method of achieving this is case based discussions giving primacy to achievement-based objectives. Harden's Ladder of Integration has been chosen as the model.⁴ The steps of the Harden ladder are shown in Figure 1 along with an explanation of the integration process in each step. The two pointed arrow on the left indicates the levels of integration recommended by the MCI. Nesting is possible for most lessons. In point of fact Nesting consistently happens in clinical subjects where the knowledge of basic sciences is reviewed and revised as part of clinical teaching either in the classroom or in the wards. To a large extent temporal coordination is feasible, if the curricular time for same or allied topics in the same phase of the course are equal. There are, however, subjects like limb anatomy in the subject of Anatomy which has no counter part in Physiology or Biochemistry making temporal coordination impossible in this circumstance. Central Nervous system constitutes a significant portion of curricular hours in Anatomy and Physiology but has no real equivalent topic in Biochemistry. Hence enforced integration in the form of Temporal Coordination is likely to adversely affect teaching of certain disciplines which have a smaller role to play in the coordinated portion. As per guidelines in the new curriculum, most of the integration should focus on "Sharing and Correlation." Sharing involves only one or two allied disciplines. In correlation some curricular time can be found for topics which run across disciplines like Tuberculosis, Lymphoma, Filariasis, Parasitic infections etc. which can be included in the form of multi-disciplinary modules during curricular hours beyond 6 semester. This will save syllabus time since repetition of the same subject in multiple disciplines

would be avoided and a holistic picture of the disease presented to students with the additional advantage of including problem-based exercises. Up to the level of correlation, integration can be carried out without major alternations in the current evaluation pattern.

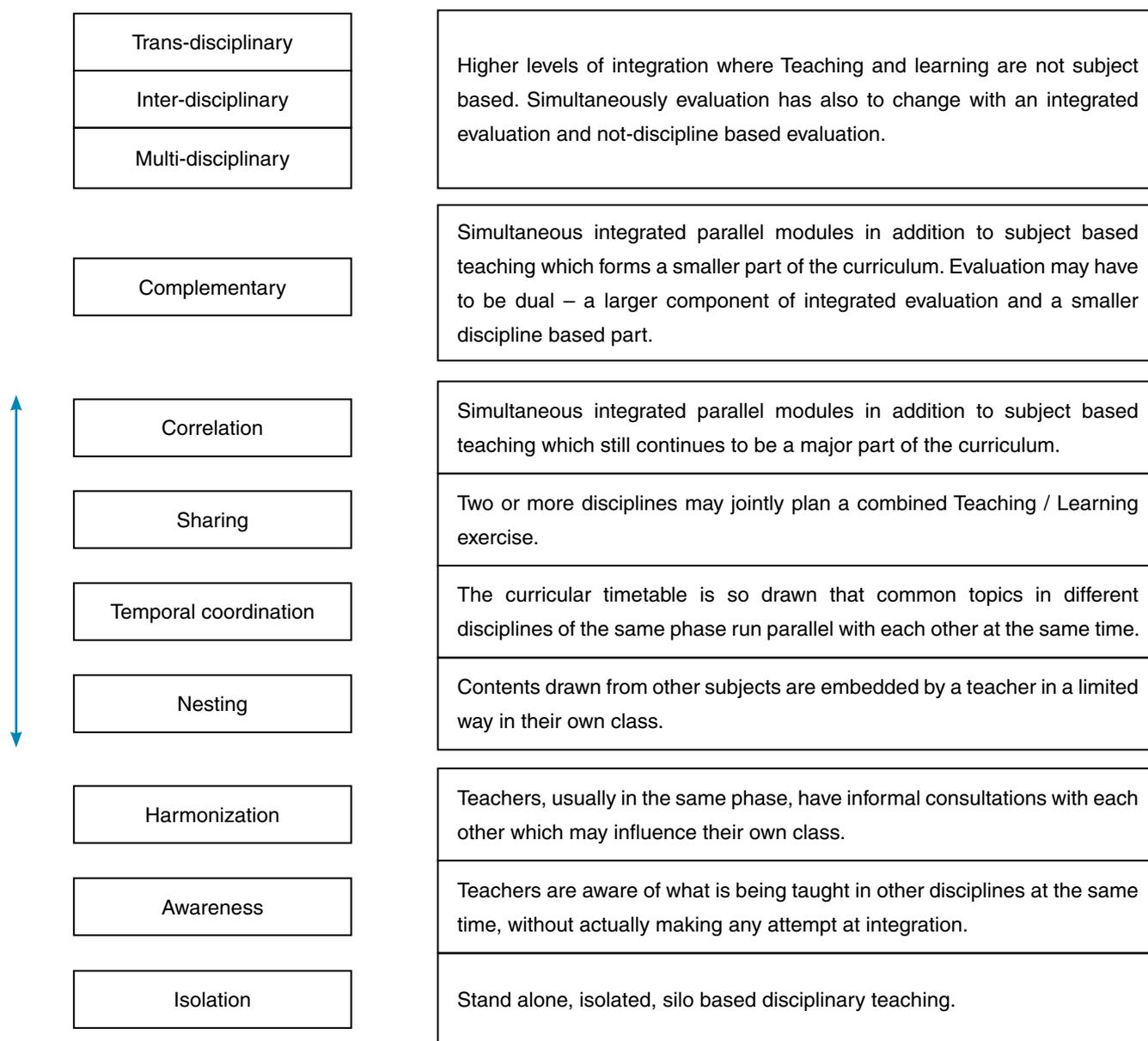
Higher levels of integration in the Harden's Ladder such as complementary teaching or Multi-disciplinary, Inter-disciplinary and Trans-disciplinary approach are not feasible in the Indian scenario. As per current information, no major changes are being planned in the new curriculum as regards the evaluation process which will still remain discipline based. For these levels an integrated, non-discipline based evaluation is necessary. In a multi-disciplinary approach a number of subject areas are brought together as a single course with themes, problems, issues as the focus of students' learning.⁴ Clinical problems and scenarios for example, ethical issues etc can serve as an ideal trigger for multi-disciplinary teaching. The topic chosen should have no discipline specific boundaries. This progresses to a higher level in inter-disciplinary integration where discipline boundaries get gradually effaced but still exist leading further to the highest level of Trans-disciplinary integration where there is only a topic or a course or a subject matter for discussion with no individual disciplinary silos at all. Individual disciplines are not mentioned or identified in the curriculum at the Trans-disciplinary level. The new curriculum discourages these higher levels of integration.

AETCOM MODULE AND ITS IMPLICATIONS

An important recent development in the medical education field is the release of the AETCOM module by the MCI. Although not a part of the main document, it is frequently referred to in the curricular document released by the MCI. The AETCOM module is a progressive step forward in recognizing the importance of soft skills like professionalism, communication and ethical behavior which in the previous curriculum were under-emphasized. The AETCOM module is a standalone document meant for faculty development. The T/L methods desirably involve case scenarios. A major deficiency, however, in this module is the mismatch between the skills desired to be imparted and the method of evaluation recommended for their certification in students. Some of the mismatch is highlighted below:

1. Competency – Awareness of what it means to be a patient – Evaluation recommended -Short Answer Questions

Figure. 1: Harden’s Integration Ladder as applicable to the new curriculum



2. Bioethical issues – Recommended Evaluation Short Answer Questions
3. Death and Dying, conveying bad news - Recommended evaluation -Short notes
4. Professionalism – Recommended Evaluation - MCQs

This is, perhaps, due to the fact that the logistics of having to deal with large numbers of MBBS students of up to 250 per batch, may make a “one is to one” assessment program (which is what is required here) difficult but not non-feasible with methods being available for same.

POSITIVE RECOMMENDATIONS IN THE NEW CURRICULUM

The new curriculum has several welcome and positive recommendations. Departmental competencies are stated in the form of Specific Instructional Objectives for all departments in all phases. For each competency there is a classification into knowledge, skill, attitude or communication depending on the competency. For definition of the acceptable level of performance of the outgoing graduate, Miller’s pyramid has been used.⁵ (Figure 2) Objectives are classified in to those requiring only knowledge alone or ability to understand and explain a concept, demonstrate or perform independently. The competency list has been drawn up by subject specialists.

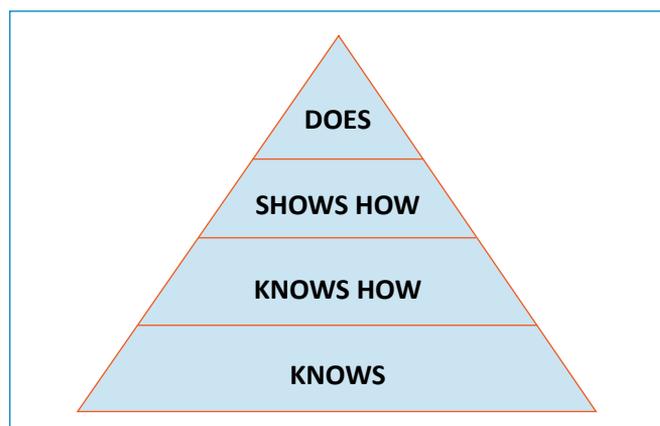
Table 1. Department-wise objectives (competencies) with suggestions for integration

Ser. No.	Department	Total list of objectives	Horizontal integration	Vertical integration
1	Anatomy	381	41	192
2	Physiology	127	27	41
3	Biochemistry	69	15	77
4	Pharmacology	85	9	42
5	Pathology	172	21	142
6	Microbiology	54	25	39
7	Forensic Medicine	162	Nil	59 (31 with AETCOM)
8	Community Medicine	107	12	46
9	ENT	76	1	8
10	Ophthalmology	60	1	9
11	General Medicine	506		292
12	Respiratory Medicine	47		26
13	Pediatrics	416		197
14	Psychiatry	117		47
15	DVL	66		44
16	Physical Medicine	43		41
17	General Surgery	133		55
18	Obstetrics Gynecology	126		31
19	Orthopedics	39		30
20	Anesthesiology	46		31
21	Radio diagnosis	13		1
22	Radio therapy	16		7
23	Dentistry	23		8
Total number of competencies		2884	H=152, V=655, T=1617	

AETCOM – Attitude, Ethics and Communication module

H – Horizontal integration, V – Vertical integration, T= Total suggestions for integration across all disciplines

Figure 2: Miller's Pyramid



The new manual prescribes methods of instruction for both knowledge and skills – for knowledge the common method advised is Lecture for larger groups and small group discussion for smaller groups.

For skills, DOAP (Demonstration, Observation, Assistance and Performance) is recommended. This is a new feature of the curriculum. For skills, the highest level of acceptability, viz. “Does”, requires independent ability to perform under supervision a pre-specified number of times which will result in certification of capacity. This again is novel. No attempt is being made in this paper to comment on the appropriateness or the necessity of individual competencies in the list since this is largely a task for departmental subject experts.

The knowledge and the skills prescribed should be matched against the definition of the Indian Medical Graduate (IMG) in the curriculum.² The major required competencies of the IMG are as follows:

1. Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

Table 2. Procedures requiring certification

Ser. No.	Department	Description of skills	No. to be certified
1	Anatomy	i. Microscopy of Epithelium	2
		ii. Diagram of respiratory tree	2
2	Physiology	i. Blood pressure measurement	3
		ii. Pulse assessment	3
		iii. RS examination	1
		iv. CNS Examination	1 (Each part of CNS) – Total 5
		v. Visual acuity, color vision, field mapping, taste and smell assessment	
3	Biochemistry	i. Detection of normal and abnormal constituents of urine	1
		ii. Estimation of serum creatinine / calculation of creatinine clearance	1
		iii. Estimation of serum proteins, Albumin, Globulin, Albumin / Globulin ratio	1
		iv. Estimation of glucose, urea in serum	1 each – Total 5 1+1 = 2
4	Pharmacology	i. Prescription writing	5
		ii. Audit of prescriptions	3
		iii. Critical evaluation of drug promotion literature	3
5	Pathology	i. CSF examination	1
6	Microbiology	i. Gram's stain	11
		ii. Hand hygiene	3
		iii. Personal protection	3
7	Forensic Medicine	Nil	
8	Community Medicine	Nil	
9	General Medicine	i. Order, perform, interpret ECG	6
		ii. Capillary blood glucose	2
		iii. Urine ketone bodies by dipstick	2
10	Respiratory Medicine	i. AFB stain	1
		ii. PFT, doing and interpreting	3
		iii. Use of inhalers – counseling	3
11	Pediatrics	i. Anthropometry	3
		ii. Development assessment	3
		iii. Breast feeding, observation and counseling	3
		iv. BMI calculation	3
		v. Prescription of Immunizations schedule	5
		vi. Naso-gastric tube passage in manikin	2
		vii. IV line in manikin	2
		viii. Interosseous insertion in manikin	2
		ix. Airway management	3
		x. Oxygen administration	3
		xi. Bag ventilation	3
		xii. Monitoring of shock	3
		xiii. IV access	3
		xiv. Calculation of fluid requirements	3
		xv. Monitoring of unconscious	3
		xvi. Dehydration assessment	3
		xvii. BLS in manikin	3
		xviii. Urine dipstick	3
		xix. Identification of BCG scar	3
		xx. Interpret Mantoux test	3
		xxi. AFB staining	3

Ser. No.	Department	Description of skills	No. to be certified
12	Psychiatry	Nil	
13	DVL	Nil	
14	Physical Medicine	Nil	
15	General Surgery	Nil	
16	Ophthalmology	i. Testing for extra ocular movements	5
		ii. Visual acuity, color chart, field mapping	1
			3
17	ENT	i. Interpretation of skiagrams of PNS, chest etc.	3
18	Ob. Gynecology	i. Conduction of normal labor	10
19	Orthopedics	Nil	-
20	Radio diagnosis	Nil	-
21	Radiotherapy	Nil	
Total number of procedures requiring certification		48	153

2. Leader and member of the health care team and system
3. Communicator with patients, families, colleagues and community
4. Lifelong learner committed to continuous improvement of skills and knowledge
5. Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession.

The 35 sub-competencies defined for these five competencies makes the attributes of the IMG clear and unambiguous.

For postgraduate education, in which mastery of skills is the primary aim, it is better to state competencies in the form of Entrustable Professional Activities. and assess acceptable levels of performance as per the guidelines of Dreyfus.^{6,7} However, for an undergraduate course like the MBBS, acquisition of baseline knowledge and comprehension is as important as acquisition of skills. The skill list has necessarily to be less complex. Hence competencies are stated in the form of specific instructional objectives which would be clear to all teachers irrespective of background pedagogic

training and skills are assessed in terms of Miller's pyramid which is easier to observe and certify. This choice, however, may be open to criticism by educational experts who may consider grading of skill levels as being equally important for the undergraduate who is being licensed to independently practice medicine as it is for postgraduates. This difference in pedagogic perspective may only be a matter of semantics.

A major feature of the new curriculum is its clear definition of levels of integration which are optimal, the departments which will contribute to acquiring of a certain competency and the scope of horizontal and vertical integration. Table 1 shows the departmental list of competencies as regards total number and the suggestions for horizontal and vertical integration pertinent to that department's objectives. A total of 2884 competencies have been prescribed for the MBBS course, out of which a total of 1617 has been mentioned as possibilities for either vertical or horizontal integration or both.

In the clinical phases beyond the third semester, all the subject courses run more or simultaneously and the students have finished their exposure to the preclinical sciences and are undergoing the teaching / learning programs in the paraclinical sciences. Hence the terms vertical or horizontal no more remains relevant and

accordingly there has been no attempt to separate integration in to horizontal or vertical in this paper as has been done in the new curricular manual.

The paucity of suggestions for integration in respect of some departments such as ENT, Ophthalmology etc. is an acceptance of the fact that forced integration for the sake of integration is likely to be counterproductive in many instances. Also, the fewer suggestions for horizontal integration in subjects such as Anatomy, Physiology, Biochemistry, Forensic Medicine etc. is a recognition of the fact that these subjects are standalone subjects at present where the scope of horizontal integration or even temporal coordination, is extremely difficult without compromising the teaching of the subject and the preparation of the students to appear in the summative evaluation which again is standalone. Misguided efforts should, therefore, be avoided in pushing for greater integration in all circumstances.

The curricular requirement of skills for each department which need to be certified is shown in Table 2. A total of 48 procedures (skills) are required to be certified although the manner of certification whether in formative or in summative evaluation is not made clear. On the face of it, the logic of this list remains obscure. For instance, the only two skills mentioned in Anatomy or microscopy of the epithelium and diagram of the respiratory tract. These would probably not be the most important requirement of the outgoing graduate after qualification. The Physiology list looks appropriate but the Biochemistry list is full of procedures which may not be required of an MBBS graduate like estimation of serum creatinine etc. It is surprising that Forensic Medicine, Community Medicine, General Surgery, Orthopedics etc. have no skills required to be certified. One would have thought that skills such as bandaging, suture of simple skin lacerations, splinting and immobilization of fractures, issue of medico-legal certificates etc. would have been considered mandatory. On the whole the skill list is skewed with no rationale for many of the listed skills and others which would be considered mandatory for the MBBS candidate missing. The whole list requires to be relooked before implementation. Many of the skills can be practiced on mannikins and certified on manikins. Skills labs are mandatory as per MCI requirement in medical colleges and would facilitate this process.. Also, as per the manual, a number of repetitions are required from the candidate before the ability to perform independently can be certified. However, the list of skills mentions only one each for many of the skills such as CSF examination, testing

for ocular movements, AFB stain etc. which may be considered inadequate to ensure proficiency.

SOME AREAS OF CONCERN FOR FUTURE REVISION

Many of the concerns have been mentioned earlier in this paper. This section is only to emphasize the earlier statements. The mismatch between the intended competency and recommended method of assessment for ensuring attainment of desired level in the AETCOM module has already been mentioned. This needs attention to ensure that the intention of the MCI as regards soft skills is realized. It is also a matter of concern that there is neither a mention of summative evaluation pattern with the new curriculum nor the weightage for formative assessment with its implementation. Summative evaluation cannot remain an area of “no-touch” with no changes being permitted or contemplated in view of departmental objections. As and when more and more integration is required to be practiced, there is a simultaneous need for changes in the summative evaluation to fall in line with needs for integrated evaluation to form part of the process. It cannot remain forever subject based.

If competencies are the goal and necessary levels are mandatory before qualification, it becomes obvious that many of these cannot be certified only in the summative process due to logistic reasons. Hence weightage for formative evaluation has to considerably increase to perhaps 50% to meet these requirements. Besides, many of these competencies require workplace based assessment. This has to be formalized in the recommendations on formative evaluation as and when it is released. Also, in view of increasing numbers of students with large numbers of admissions of up to 250 per batch, along with the difficulty of getting external examiners for a prolonged final examination, the summative process should drastically change from the current format to one which permits greater use of measures such as OSPEs / OSCEs, more objective written methods of evaluation and a skill based final examination.

The competencies list on the face of it looks slightly irrational as the number of competencies per subject and the curricular time available for that subject are not matching. For example, Medicine and Surgery have more or less the same number of curricular weeks; however, 506 mandatory competencies are listed for medicine and only 133 for surgery. Likewise, 416 competencies are listed for Pediatrics and only 39 for Orthopedics which have the same curricular time. There are many other such examples. Gross mismatch between number

of competencies to be attained and available curricular time would apply pressure on some departments to fulfill the requirement of training in these competencies. It appears, therefore, that the subject committees did not sit together to plan the list and competencies submitted by individual subject specialists have been merely compiled. One possible measure is to realize that many of the subjects in the current curriculum have disproportionate amount of curricular time largely as a matter of tradition. For example, General Surgery is not truly a major undergraduate discipline deserving of equal time with General Medicine. The requirements of outgoing MBBS graduate to practice what they have learnt in the huge General Surgery curriculum are minimal. Realization of the fact should logically lead to reduction of time for General Surgery and allotting the curricular time thus freed to those subjects which are more important for an MBBS graduate to practice, such as General Medicine, Pediatrics, Psychiatry, Dermatology etc. Or, as an alternate measure, fresh courses can be introduced on subjects such as Rational diagnosis and Therapy or Palliative Medicine or the Care of the aged which may be more relevant in the newly released curricular time. This, however, calls for a transformational change, which is likely to be forcefully opposed.

The skill list has to be rationalized based on the job requirement of the IMG after graduation instead of being left to individual subject experts. Also, those finalizing the skills required to be certified should have a relook to consider issues mentioned earlier regarding some departments not having any skills to be certified although they occupy a significant part of the curricular time. The whole process should again be based on the work expectation of the IMG. The approved list of certifiable skills should be based on recommendations of a multi-disciplinary committee and not on individual subject committees.

SUGGESTED STRATEGY FOR IMPLEMENTATION

The primary aim of the preparatory strategy should be Faculty Development Programs so that all faculty participate in this new endeavor as willing collaborators and not as reluctant dragons. The first step is to apprise all the faculty and not just the heads of departments and the curricular committee members of the new curriculum, the changes in it with reference to the 1997 document, the changes visualized in the teaching / learning programs, suggestions regarding integration and what it implies and the skill list with mandatory certification.

Integration is a sensitive issue and needs to be covered in workshop mode explaining the Harden's ladder and its steps and why one should not go above a certain level of integration with the current subject or discipline based evaluation. It should be emphasized that the aim of integration is to facilitate learning and explain relevance of a topic to future practice and not a forced bringing together of departments. Soft copies of the MCI document should be sent to all faculty so that they may come prepared for the workshop.

The next step is special faculty development programs for the teachers of the first phase, who have to implement the new curriculum with effect from August, 2019. In this activity, the focus should be on clarifying doubts and reviewing the existing curriculum and the new document to identify where the differences lie. The task in this workshop is to prepare a new curricular plan for phase I by March, 2019. The focus should be on

- a. Review of the competency list for the three pre-clinical subjects by all faculty (not only HoD or the curriculum coordinators).
- b. Listing of the competencies and sub-competencies list by grouping in to Teaching / Learning Units (i.e. topics which can be grouped together for a single or a few continuous classes).
- c. These teaching / learning units pertaining to "Know and Know how" as per the curriculum can be divided in to those requiring large group teaching and those requiring small group activities. Department faculty has to make a decision on this jointly.
- d. Identifying topics where more than one department can useful participate as a sharing exercise as per Harden's ladder.
- e. Those that require skill training (Show how / independent performance to be classified in to those which require practical / clinical / skill lab / standardized patient exposure.
- f. Discuss and establish a method of internally certifying those skills which are require to be certified in the MCI document.
- g. Skill training time table can be embedded in the schedule as and when the schedule is prepared.

Training of all faculty, not only Heads of Departments, in the AETCOM module which will run as a core through the curriculum is the next mandatory step. The responsibility for this will lie on MEUs which should organize workshops for groups of faculty (not more than 30 at a time). The workshop can run for two days each and will intend to train all faculty by end of February, 2019. Time tabling and scheduling can wait till MCI notifies the new Graduate Medical Regulations. All preparatory work for phase 1 is to be completed before end of March, 2019 and jointly approved by both colleges. Initiation of work for phases 2 and 3 (para-clinical and final year part I), can begin simultaneously after training of those concerned faculty, so that the documents with respect to those phases are ready by end of 2019. The finalization of the curriculum for the Final year (Phase IV) can be undertaken in the next Academic year.

As per the MCI document, **integrations should not exceed 20% and should not go beyond “correlation” as per Harden’s ladder.** It is suggested that integration in first year is restricted to temporal coordination to the extent possible (without disturbing the subject schedules and depending on the length of the teaching / learning activity required for each of those units). Sharing can be encouraged between subject like Pathology and Microbiology in phase II where ever appropriate. Every pre-clinical class should have “nested” the corresponding clinical relevance of the topic. The nested part can be covered either by the teachers of the subject or where required by clinical faculty. After semester 5, one can progress to the level of ‘correlation’. Modules can be arranged in the afternoon of working days or Saturday morning which are based on common topics running across departments such as Tuberculosis, Lymphoma etc. This modular list must be prepared by all curriculum committees sitting together based on overall requirement and relevance. In semesters ^{6,7} the modules can run once a week and in semesters 8 and 9 twice a week. Students should be made to actively participate in these modules by encouraging problems solving exercises. The

strategies, of course, will vary slightly from institute to institute depending on facilities.

CONCLUSION

The new curriculum has several advantages and is a glaring improvement on the previous version of 1997. It defines an IMG, mentions departmental competencies and sub-competencies, methods of appropriate teaching and evaluation for these and provides a list of skills with level of proficiency required. It also suggests areas of fruitful integration and the method of integration as per Harden’s ladder.

However, there are notable deficiencies in the departmental list of competencies which require relook and revision. The certification process of skills also requires clarification. There is no mention of any forthcoming change in the evaluation system to meet the requirements of the new curriculum. All these need to be addressed before the next academic year and before release of the new Graduate Medical Regulations booklet.

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