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Editorial

The Integration ladder- a tool for implementing integrated teaching-learning

The most prominent models for integration discussed over the past few decades were the Integration ladder introduced by Ronald Harden. Harden has developed a more concrete framework on which to map this spectrum integration by establishing discrete categories along an integration ladder[1] which is designed to aid the planning process in implementing and evaluation integrated teaching-learning. Harden provides descriptions of each step on the ladder and makes clear distinctions between the progressive integration from one step to the next.

Eleven steps in integration ladder

The integration ladder has 11 steps from 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 students take more responsibility for the integration.

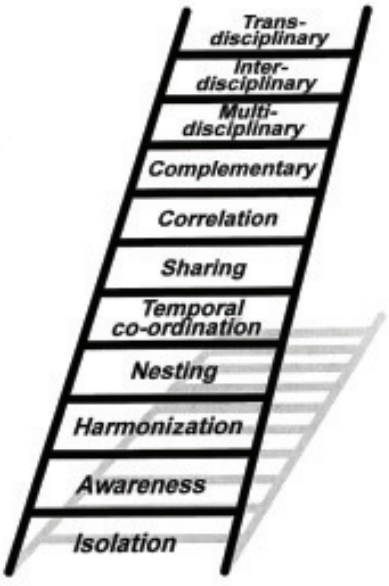

Fig 1: *Integration ladder*

Step 1 isolation (Synonym- fragmentation)

The first step is 'isolation'. Departments or subject specialists organize their teaching without consideration of other subjects or disciplines. Each discipline looks, from the perspective of their own discipline, at the curriculum content in terms of areas to be covered, depth of coverage, sequence and timing. Students attend a lecture on anatomy, and then move on to a lecture in physiology with neither lecturer being aware of what was covered in the other lecture.

Step 2 Awareness (Synonym – acquaintance, conversance)

The second step is awareness, in which teachers of one subject is aware of what is covered in other subjects in the curriculum. This can be achieved through appropriate documentation about the aims and objectives and contents of each course. Given this information, the teacher can take account of what colleagues cover in other parts of the course when planning his or her teaching, avoiding unnecessary duplication.

Step 3 Harmonization (Synonym- connection, consultation)

In harmonization, teachers responsible for different parts of the same course, consult each other. The consultation process takes place through informal discussions between teachers or through more formal curriculum planning committees and meetings. This consultation process encourages teachers to adapt their programmes so that each course makes an appropriate contribution to the curriculum.Fogarty[2] has described this stage of integration as 'connection'.

Step 4 Nesting (Synonym -infusion)

'Nesting' is the fourth step of integration. Content drawn from different subjects in the curriculum may be used to enrich the teaching of one subject. In

nesting, the individual subjects or disciplines recognize the broader curriculum outcomes and relate their teaching programme to these.[3]

Step 5 Temporal co-ordinations (Synonym - parallel teaching, concurrent teaching)

In temporal co-ordination, the timing of the teaching of topics within a subject, however, is done in consultation with other disciplines. The timetable is adjusted so that topics within the subjects or disciplines which are related are scheduled at the same time. Similar topics are taught on the same day or week. This approach has been described also as 'parallel' or 'concurrent' teaching. In a basic medical science programme with temporal co-ordination, physiologists address the subject of the function of the heart at the same time as the anatomists look at the structure of the heart; thereby the heart being examined from the two perspectives in the same time-frame.

Step 6 Sharing (Synonym - joint teaching)

Two disciplines may agree to plan and jointly implement a teaching programme. The shared planning and teaching takes place in two disciplines in which overlapping concepts or ideas emerge as organizing elements.[3] The two disciplines which come together to offer such a programme are usually complementary subjects and the joint course produced emphasizes shared concepts, skills and attitudes. The departments appreciate that together they can teach the subject better, more effectively and more efficiently, than either could alone.

Step 7 Correlation (Synonym -concomitant programme, democratic programme)

Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching. This session brings together areas of interest common to each of the subjects. An example of correlation is a basic medical science programme where students study topics, such as the gastrointestinal system first from the perspective of each of the subjects, and then meet on Friday afternoons for an integrated session.

Step 8 Complementary programme (Synonym - mixed programmes)

The 'complementary' approach has both subject-based and integrated teaching. The integrated sessions now represent a major feature of the curriculum. The focus for the teaching may be a theme or topic to which the disciplines can contribute. Running alongside the integrated teaching are scheduled opportunities for subject-based teaching.

Step 9 Multi-disciplinary (Synonym - webbed, contributory)

A multidisciplinary approach brings together a number of subject areas in a single course with themes, problems, topics or issues as the focus for the students' learning. The theme in a multidisciplinary programme may be a structured body of knowledge that needs to be mastered but which transcends subject boundaries. The systems of the body are used frequently as an integrating theme.[4] In the thyroid module of the endocrine system block, for example, physiology may contribute to thyroid hormone synthesis and its regulation, pathology to the underlying disease processes, pharmacology to the action of anti-thyroid drugs, surgery to the management of goitre, and medicine to the clinical manifestations and investigations of thyroid disease. The theme or problem is the focus for the student's learning but the disciplines preserve their identity and each demonstrates how their subject contributes to the student's understanding of the theme or problem. 'A discipline', suggested Drake[5] 'is easily identifiable within the teaching strategy.

Step 10 Inter-disciplinary (Synonym - monolithic)

Jarvis[6] defines interdisciplinary as 'a study of a phenomenon that involves the use of two or more academic disciplines simultaneously.' In the taxonomy proposed in this paper, interdisciplinary teaching implies a higher level of integration, with the content of all or most subjects combined into a new course with a new menu.[7] In the interdisciplinary course there may be no reference to individual disciplines or subjects, and subjects are not identified as such in the timetable. Implicit in the move from a multidisciplinary to an

interdisciplinary approach may be the loss of the disciplines' perspectives.

Step 11 Trans-disciplinary (Synonym-fusion, immersion)

In trans-disciplinary, as in interdisciplinary integration, the curriculum transcends the individual disciplines. Trans-disciplinary education is reflected in learning described by McCombs[8] as 'an individual process of constructing meaning from information and experience, filtered through each individual's unique perceptions, thoughts and feelings.' An example of trans-disciplinary integration is the final phase of the medical curriculum at Dundee. The curriculum in the first three years of the students' studies is integrated round the body systems.[9]In the last two years, students are attached for periods of time to a range of specialties in the hospital and in the community and experience the various contexts in which medicine is practised. A set of 113 clinical problems or tasks provides the students with a framework for integrating their experiences.[10]Students look at each of the tasks from the perspective of the different attachments. Abdominal pain can be taken as an example. Students have an acute surgical perspective in their surgical attachment, and different perspectives in the medical attachment, in the gynaecological attachment and in their community attachment in general practice. A printed or electronic study guide[11] is a key element in helping the student with the challenge of integrating these different experiences.

Conclusion

Curriculum integration is an important strategy in medical education but is a complex concept.[12] 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 assessment. The published timetable or syllabus will usually give an indication of the level of integration in the curriculum. The 'integration ladde; encourages teachers to explore the integration options available and to discuss the extent or form of integration most appropriate for their own context.

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