BLOCK LECTURES AND THE INTEGRATED MEDICAL CURRICULUM

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The term 'integration' means different things to different people. However, one concept of integration that is common to all is the combining of different parts to form a whole, which is meaningful. In terms of integrated learning we have to look at a whole which is meaningful to the learner. What then is meaningful learning? Meaningful learning is the extent to which the learner sees new learning as fitting in with what he already knows. If what the learner learns anew does not fit in, or in fact clashes, with existing knowledge, he has difficulty integrating the new learning to his existing knowledge.

The term meaningful, as it applies to learning, is also used in another sense. This is the extent to which the learner sees new learning applicable to his future needs. In this sense meaningful learning has the same meaning as relevant learning. In the case of the medical student relevant learning is that which is applicable to the tasks of a doctor, or rather the type of doctor that the student sees himself as becoming. As the majority of medical students see themselves as becoming clinicians in the future, relevant learning is that which can be applied clinically. With the present emphasis on community orientation, it is possible that some students see themselves as becoming community physicians in the future. Thus relevant learning is that which can be applied in a clinical or community setting.

Returning to our definition of integrated learning, we can say that integrated learning is that which the learner can fit in with his existing learning, as well as that which can be applied to his future tasks. For the latter to occur it is best that learning takes place in an environment which is the same as, or resembles as closely as possible, the environment in which that learning is applied. Thus for the medical student integrated learning takes place best in the hospital or in the community, rather than in the lecture theatre. That brings me to the dilemma which confronted me when I was asked to talk to you on "The Block Lecture and the Integrated Curriculum".

If integrated learning best takes place, for the medical student, in the hospital and in the community, how then can we reconcile the concept of a "block lecture" with an integrated curriculum. The secret lies in the relative nature of integration. In our definition of integration, the terms "part" and "whole" are relative. The whole in one sense may be part of a larger whole. For example, a cell is part of a tissue (whole); the tissue is part of an organ (whole); the organ is part of an organ system (whole); the organ system is part of the body (whole); and so on. Integration can occur at any level. In fact, any curriculum is integrated to some extent. What we are attempting to do is to increase the degree of integration in the curriculum. And I intend, in my talk today, to look at the extent to which the block lecture increases integration, and how we can improve the degree of integration further by planning it appropriately.

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But let us first look at the factors which led to a demand for this trend known as the integrated medical curriculum. The main reason was the growth of knowledge. As knowledge grew, with a doubling time every 15 years, it became impossible for the body of medical knowledge to be contained within one discipline, or to be mastered by one group of individuals. Knowledge began to be compartmentalised into a few disciplines, each of which became the domain of a department in the medical school. However, knowledge within each discipline continued to grow as well, and either new disciplines, or sub-disciplines of the original discipline, emerged. While growth of knowledge was essential the subsequent creation of departments and sub-departments resulted in the curriculum being fragmented without any communication across departments. This resulted not only in a tremendous increase in the load of material which the medical student was called upon to master, but also in the department forgetting the primary purpose for which this material was being imparted to the student. Students and faculty began to question the relevance of all this information, and this led to some medical schools taking a close look at the way in which the material that had to be imparted to the student was packaged. They began to question the appropriateness of packaging according to disciplines and looked for more meaningful ways of so doing. Thus arose the different models of integration, pioneered by Case Western Reserve Medical School.

In order to be able to arrange the content of the medical curriculum into a form which was more integrated it was necessary to identify themes or strands around which such arrangement could take place. In the early attempts at integration the organ system became the organizing theme. The content related to each organ system, irrespective of the discipline, was included in each segment of the curriculum. It was felt, however, that the student must first master the material related to the normal before studying the abnormal. Thus arose the concept of horizontal integration. While this enabled the student to see the links between, for example, structure and function related to a particular organ system, it still did not fulfil the student's need to see the application of normality in practice. In order to increase the perception of relevance of learning about normality by the student, examples of what was learnt were included in the basic medical sciences. Thus were sown the seeds of vertical integration. In many schools clinical faculty were requested to provide learning experiences, for the preclinical student, in the application of basic medical sciences. Naturally students were impressed by, for example, an orthopaedic surgeon demonstrating how he used knowledge of the structure of the knee joint in the management of disorders of the knee. The main objective of these inclusions was not so that the student would be able to manage the disorders of the knee, but to enable him to see the purpose of learning about the structure of the knee in relation to his future practice. According to our previous logic integration was thereby greatly enhanced. The student learned about managing the disorders of the knee when he came to the clinical years, but in so doing he was able to recall what he had already learned about its structure in his preclinical years. Thus vertical integration was promoted at both preclinical and clinical stages of the curriculum, though the main objective of each was different. The curriculum which until now was sharply divided into pre-, (para-) and clinical segments, with basic medical sciences dominating the first two and clinical the last, became more an interdigitating one between the basic and clinical sciences, with an increased emphasis on community medicine. A much more recent development was the introduction of a behavioural stream into the curriculum. In my own medical school today, we can identify four separate yet interdigitating streams extending throughout the curriculum, with components of each stream integrating with those of the other three.

Another development was the identification of clinical, and later community, problems as the theme around which the knowledge was arranged. Pioneered in medical education at McMaster this method of integration

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was grounded in the original work undertaken in mathematics education, where it was shown that, given the opportunity and minimum knowledge, students could through a process of reflection, trial and error and sharing of existing knowledge, arrive at solutions to problems which were slightly beyond their depth as individuals. Thus arose the concept of problem-based learning and it was only a matter of time before medical schools took up the growing trend. The heights of integration were reached by this method as attention was now being focussed on the psychological environment of learning similar to the psychological environment of practice. The future professional would be called upon to deal with both clinical and community problems. Learning which takes place around similar problems were more likely to be relevant. Also, because the learner had to grapple with the problem in the context of his existing learning, it was more likely to be meaningful. Thus both conditions for integrated learning were being met by this new type of curriculum organization.

As the trend of integrated curriculum in medical education grew medical schools began to introduce practices which cut across the traditional departments of the school. In doing so, however, many schools focussed on one aspect of integration without considering the effects of the change on other practices. For example, some schools introduced integrated examinations even though learning experiences were fragmented. Other schools introduced the integrated multidisciplinary laboratory, but continued to offer separate lectures and practical classes within each discipline. The term "block lecture" came to be identified with the Korean medical school. You are in a better position than me to trace the origin of this term, but as I saw it this was an attempt to introduce into the lecture program a segment of the curriculum which was arranged around organ system blocks and which involved faculty from several relevant department.

While these were laudable attempts at increasing the degree of integration in the curriculum, they suffered from two drawbacks :

1. they involved only a relatively small segment of the curriculum and thus their overall effect on the student was diluted by the remainder which was traditionally compartmentalised ;
2. they affected predominantly one component of the curriculum without adequate consideration of repercussions on the other components.

The curriculum is a system, which means that it consists of many components, such as the philosophy, objectives, content, methods, resources, sequence, duration, students, teachers, administration and location. As with any system a change which affects one component has repercussions on the others. Changing the system of lectures without at the same time, for example, changing the system of exams, is unlikely to result in the achievement of the aims of the change, which is integrated learning.

I do not wish to pass judgements on a practice without having studied it adequately, and I have certainly not studied the system of block lectures that prevails in Korean medical schools adequately as yet. Perhaps you have experienced problems with it yourself, and that is why you proposed this topic for my address today. You may be able to raise some of these issues in the discussion which follows this address, and I hope you do, so that I can get to know your system better. Let me say this. Sometimes a curriculum appears to be very well integrated on paper (when one reads descriptions of it) but its actual implementation could be far from integrated, as my previous experiences in certain other countries have shown.

Without knowing very much about how your "block lecture" is conducted, let me give you some ideas as to how I think a lecture could be given to increase the amount of integrated learning that students could acquire through it. The important ingredient for integrated learning is the establishment in the student's mind of links between the different disciplines. We said integration is the combination, of parts to make a whole. But the

whole is greater than the mere sum of the parts. It is greater because it is not merely an addition of the parts but the establishment of the links between the parts. This has to be kept in mind in an integrated lecture. I understand you organize block lectures around organ systems. The lecture could confine itself to horizontal integration, although I am convinced that, if integration is to be effective, some degree of vertical integration is inevitable.

A lecture can be arranged in various ways. One method is known as the Chaining Lecture. Here the information is given in small bites, but each bite is summarized before moving on to the next. For integration to occur in a lecture arranged according to this method, not only should there be links between the information within each bite, but also between the different bites. At each point where there is an arrow, links should be apparent. For example, if you were giving a lecture on the knee joint, the first three bites might relate to the structure of the knee joint, e. g. capsule, ligaments and semilunar cartilages. These should be linked to each other and summarized before moving into the next bite, which could be on the function of each of these. But in providing information about their function links should be established with their structure, for example, the importance of the direction of fibres in the anterior cruciate ligament.

Another method of arranging the lecture is known as the Classification Hierarchy. This is particularly useful when dealing with content which lends itself to a classification, such as "Joints of the Body" or "Nephritis". The classification enables the lecturer to deal with each component at a time. The danger is that he may not show the relationships or comparisons between the different classification sets, at each level. For the lecture to be integrated according to this method, these links have to be drawn. For example, the functional differences between primary and secondary cartilaginous joints and relating this to the sites in the body where each type is found.

A third way of arranging a lecture is the problem-centred lecture. Some educators think problem-based learning can only occur by students discussing a problem presented to them by themselves, with or without a facilitator. I think one can even promote problem-based learning through a lecture given by a lecturer, using the problem-centred method of arranging the content of the lecture. Here the lecturer first presents a problem, e. g. a soccer player who has injured his knee. He can then present to the students the possible reasons for the existence of the signs and symptoms. These become the hypotheses which the lecturer then sets out to prove or disprove, in turn, using relevant bits of information. In this way the students learn the items of information which are required to solve the problem. But all this is done in a very interesting lecture. As links are always being established in this type of lecture it reaches a high level of integration.

Most important, however, what ever method of arranging the lecture is used, is to demonstrate application of that learning in the context of the student's future work. This is why vertical integration should always be attempted within the lecture, even though it is minimal. The sequential nature of learning mandates the move from one to the other, e. g. normal to abnormal, or problem to hypotheses to evidence. The immediacy of application in vertical integration facilitates retention. The clinico-pathological conference way one of the most effective methods of vertical integration, but was unfortunately used by senior faculty to score points over each other. One difficulty experienced in attempts to adopt vertical integration is that often clinical expedience and opportunity determine the type of patient on which teaching can occur.

It is thought by some that team-teaching is essential for an integrated lecture. This is where a group of teachers participate in the same learning experience on a given topic. While team-teaching is a good practice, it is not essential for an integrated learning experience. In fact a poorly planned and implemented team

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-teaching episode is far worse than a lecture given by a single teacher who has an all-round command of the topic. Often, team-teaching consists of a series of sequential mini-lectures on the topic, without any links being established between them. This is indicative of poor planning. If team-teaching is to be successful in bringing about integrated learning each experience has to be carefully planned before-hand, with each contribution linking with the others and the links being made apparent to the students. There are different patterns of team-teaching which can be used as the basis for planning a lecture, and all of them, especially the second, can enhance integrated learning.

Integration in the medical curriculum has several advantages, but those who are not in favour of it are quick to point out the disadvantages as well. I have already referred to the advantages of relevance and meaningfulness and to the likelihood that information will be retained longer if learnt in an integrated manner. The other advantages are that faculty are more cohesive, as they work together, rather than in isolation within their own domain, and they also learn much from each other. Some educators argue that integrated teaching is spoon-feeding, and that students should learn to integrate themselves. I believe that it is the teacher's task to facilitate such integrated learning, by first being integrated themselves. Undoubtedly, good integrated teaching experiences take up much time in planning, like any new undertaking. But once planned, the amount of time in implementation is no more than in a discipline oriented curriculum. One danger in an integrated curriculum is the possibility of gaps in teaching. Another is that, until such time as teachers get used to teaching outside their primary specialty, there is likely to be some superficiality in the content that is taught. Thus care, vigilance and close monitoring are necessary in the early stages of introducing integration, as with any innovation. The last potential disadvantage is the difficulty which integration may create to the assessment program, which I will deal with next.

As I pointed out earlier, an integrated curriculum with a disintegrated examination system will not achieve the objective of integrated learning in the student. We are all well aware that students learn towards exams. If we do not make our exams integrated, or require the student to use his integrative capacities to achieve success, then students will continue to learn in a compartmentalised manner. How can we make our exams more integrated?

I have pointed out earlier that the essential criterion for integrated learning is the establishment of links between the disciplines in such a way that learning is both meaningful and relevant. If that is so then we must also test these links. Such testing can be undertaken even within discipline-oriented exams. I will show you two examples of questions, essay and MCQ, which I have set for my students in Anatomy. I believe these questions call upon the student's ability to link learning from different subjects, though primarily testing Anatomy.

I should perhaps at this stage refer to some of the issues and problems that integrated schools have had to face in attempting to integrate their examination system. One of the oldest problems was the effect of national exams, in those countries which require their graduates to pass a national exam, which was by and large disintegrated. We are all aware of the difficulties Harvard Medical School experienced in the 1960s when immediately after the change to an integrated curriculum the performance of their graduates in a "disintegrated" national board exam fell below the usually high rank that they were known for. Although the curriculum quickly reverted to a discipline-based one, it was the exam which was at fault, not the integrated curriculum. It is of interest to note that, after a delay of over 25 years, Harvard has now gone into a much more integrated curriculum.

Another source of difficulty is the external examiner who comes from a traditional school and is unable to identify with the integrated curriculum. I believe external examiners should fit in with the philosophy of the school, or should not accept the invitation to be one. If in spite of continuing to accept they do not fit in they should not be re-invited.

Some countries require schools to satisfy a credit system which is based on disciplines. That does create problems for a school which attempts integration and does not divide up the curriculum into disciplines. I do not see the need for a credit system in medical education, unless the elective component within the curriculum is so large that some formula is necessary to equate different tracks.

Other issues to which medical educators have given attention in implementing integrated curricula are methods of apportioning marks between disciplines, where such is required, and the manner of making pass-fail decisions on students who do not satisfy some components. For example, how does one separate out marks from an integrated question into different disciplines? What should the student be asked to repeat if he is deemed to have failed the Anatomy component in an exam which was integrated. These are important issues which the innovator has to address, but I do not have the time to go into strategies in this address.

As we enter the twenty-first century, as knowledge continues to grow, as technology develops in leaps and bounds, as populations become more and more aware of their rights to health care, the need for an integrated system of care, and consequently of medical education, will increase. If we do not move from merely paying lip-service to the concept, through an insignificant change here and there in the curriculum, to one that is truly integrated, we are likely to find ourselves as medical educators at the butt-end of a public outcry, and the noble profession of Medicine is likely to revert to the trade of the pre-Hippocratic era.