The Medical Teacher

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How do students learn?

INTRODUCTION

Any attempt to answer this question must take account of why students engage in learning activities: their intentions, motivations, aspirations and interests. Good teachers have always taken pains to find out what they can about these matters but researchers into learning have, until quite recently, tended to ignore them with the result that many of their findings have not been of much use to the practising teacher.

If we try to look at things from the perspective of the student this enables us to develop a view of learning as an interaction between what students bring with them and their perceptions of the context in which learning takes place. On the one hand are the knowledge, interests, attitudes and aspirations which students bring into the classroom, and on the other the subject-matters, teaching methods, learning tasks, assessment procedures, teachers and departmental environments which they encounter in the university.

It is important to appreciate that students and teachers often have very different views of the context in which learning takes place. These differences frequently result in outcomes which satisfy neither group of participants, a point made by Entwistle (in Marton et al, 1984, p. 2): ‘... as educators we should be much more concerned than we are with the quality of learning. Much of our current teaching and assessment seems to induce a passive, reproductive form of learning which is contrary to the aims of the teachers themselves’.

Further illustrations of this lack of congruence between teachers' and students' perceptions of the context of learning can be found in the reports of some medical educators on their own learning experiences (Powell, 1983, p. 266), reports which would surely have made depressing reading for their teachers:

'I was subjected to a conventional medical curriculum from which I learnt nothing except how to work just sufficiently to scrape through year by year.'

'I latched on to the idea that to learn you got a clear view of what you were expected to know, and learnt it, word for word. Not much thinking. Just learn the sacred text. Unfortunately the apparent success of this mind-stunting technique impressed me and retarded my mind's development for years to come.'

WHAT STUDENTS BRING WITH THEM

When students arrive at university they bring with them a well-formed set of beliefs, attitudes and values; a great deal of information; a large number of concepts and opinions; a rather idealistic view of their chosen profession; an unrealistically high expectation of their future academic achievements; an interest in what they envisage they will be...
learning; and a determination to succeed in their course of study.

Most medical educators, like their colleagues in other disciplines, often make incorrect assumptions about this 'mental luggage' which students carry into the classroom. This is scarcely surprising as few academics make a serious attempt to discover the nature of the foundations upon which all their teaching must stand (or fall), or to enquire into what stays with their students after graduation. Their overwhelming concern is with what happens between enrolment and the final examinations, and this concern is shaped mainly by the teacher's perspective rather than that of the student.

Space permits mention of only three of the more important items in the students' 'luggage'. First is the approach to study, the general conception of what is involved in learning something. This has been formed by years of experience in school characterized by working under the close supervision of teachers, the mastery of factual information in order to do well in examinations, and the belief that there is one correct solution to a problem or answer to a question. This approach has led the student to success in the past and is thus likely to persist, even though it may no longer be appropriate in the university environment.

Second is the desire and determination to do well academically. This has also led to success and entry into the medical school but, as the earlier quotations indicated, it can lead to study practices which hinder the intellectual development of the student and obstruct the growth of understanding. To succeed within the new environment students are likely to do whatever they perceive to be necessary for success, even though this is often at variance with the aspirations of their teachers.

Third are the concepts which students have already formed in relation to whatever subject-matter they will be engaged in studying. These concepts are often erroneous or poorly grasped, although they are often of a quite fundamental nature. Some examples are the following: normal, average, force and evolution. The set of concepts which students bring with them into the classroom is firmly entrenched as a result of being held for many years. These concepts provide the means by which the student interprets new experiences and attaches meaning to them. They form what Abercrombie (1969) calls 'schemata', that is, mental structures into which new information and knowledge must be made to fit if it is to be meaningful to the student.

Unfortunately, recent research has indicated that these schemata are extremely resistant to change. Dahlgren, for example, (in Marton et al, 1983) has shown that many students acquire the ability to speak the language of their discipline, and perform well in examinations, yet continue to entertain the naive ideas which they brought with them when beginning a course of study. In order to modify or displace these erroneous concepts it appears necessary to, first, accurately determine their characteristics, and then devise methods of teaching which address them more directly and thus be more likely to succeed in changing them.

The evidence of the work of Dahlgren and others indicates that conventional teaching methods have only limited impact upon students' basic misconceptions.

The importance of what students bring with them cannot be over-emphasized. Its significance lies in its power to influence the ways in which they respond to the content of what they are being taught. Teachers often take for granted that students are very much like themselves in that they share a common set of basic ideas and assumptions. This is not true. Students interpret what they hear in lectures and see in laboratories in terms of their own view of reality rather than that of the teacher. As teachers we need to be far more aware of this than we usually are. It is no use blaming undesirable learning outcomes upon the poor preparation, slothfulness or limited intellectual ability of students. It is our responsibility as teachers to discover, at the beginning of each course, the level and extent of the knowledge possessed by students. Even more important is the need to identify the extent to which basic ideas are misunderstood. Then we shall be able to design our teaching efforts so that they focus upon the elimination of misconceptions and the development of understanding.

THE CONTEXT OF LEARNING

The medical student encounters an environment characterized by a heavy workload, a variety of staff often be helping and to develop flexibility, criticize the ability to material. Study is required of which leads to which favour those and the tailors they think the their assessment was clearly shown (1968) and in coined the use to 'describe' important thin...
subject-matters (many of which are unfamiliar) dense with factual material and new terminology, frequent assessment hurdles, peers who have often acquired an excessively competitive style at school, teachers who themselves carry a heavy workload, a demanding series of learning tasks, and many conflicting demands on their time.

To cope with all this they must adopt learning strategies that will enable them to become qualified. They therefore attend carefully to any signals which seem to indicate what is expected of them. The loudest signals emanate from the assessment system since...this is what finally determines academic success and entry into the desired career. It is being recognized increasingly that the most important single force which shapes students' approaches to study and learning is the system of assessment. If we wish to influence how students learn we should, therefore, look very closely at the ways in which we assess their performance.

Staff often say that their teaching is directed at helping students to understand the subject-matter and to develop creativity, problem-solving skills, flexibility, critical thinking, open-mindedness, and the ability to analyse and synthesize complex material. Students, however, often perceive what is required of them in a very different manner which leads them to adopt approaches to learning which favour the reproduction of factual material and the tailoring of assignment work to fit what they think the staff want. The important role of the assessment system in shaping this approach was clearly shown in the findings of Becker et al. (1968) and in the work of Snyder (1971) who coined the useful phrase 'the hidden curriculum' to describe the students' view of the most important things they were required to learn.

The work of Marton and his colleagues (Marton et al, 1984) has suggested the usefulness of distinguishing between what they call 'deep' and 'surface' approaches to learning. The first approach is concerned with understanding the content of study material whereas the second is largely aimed at reproducing it. Assessment procedures play an important part in encouraging many students to adopt a 'surface' approach, but many other factors are also involved. These include overcrowded curricula, heavy reliance on lecturing as a teaching method, frequent use of 'cookbook' laboratory experiments, large numbers of assignment tasks, and a workload which leaves little time for reflection and integration. Faced with all this it is small wonder that many students give up trying to understand what they are doing and concentrate upon satisfying what they see to be the requirements of the examiners. As Laurillard (in Marton et al, 1984, p. 143) has pointed out:

'...Students take a largely rational approach to learning. They consider what is required of them, they decide on priorities, and they act accordingly. The teacher plays an important part in forming their perceptions of what is required and what is important, and it is this, as much as their style of presenting the subject-matter, which influences what and how their students learn.'

**WHAT DO WE WANT STUDENTS TO LEARN?**

Medical educators, probably more than any other group concerned with preparation for a profession, have been much influenced by the 'behavioural objectives' movement in curriculum design. This has undoubtedly helped teachersto think more clearly about what they want their students to learn but it has also lead to a concentration upon end-of-course achievements rather than the longer-term effects of learning. It is always a salutary exercise for teachersto ask themselves what they expect students to retain years after almost all the detailsof the contentof a course have been forgotten. The answer to this question can then be used to sieve course content, learning tasks, teaching methods and assessment procedures in order to identify their relevance to the basic aims of teaching.

If we were to do this we would discover that much of what we currently teach would fall through the sieve in much the same way as it passes through the heads of students. This should encourage us to focus much more sharply on the key elements of what we wish students to learn and to modify the curriculum and our methods of teaching to ensure that these things are learnt and learnt in a meaningful manner so as to be more likely to endure into the years of professional practice.
The competencies required for successful medical practice are progressively developed through the daily experience of that practice. The knowledge and skills involved are such that they can never be mastered: learning continues throughout the working life of professionals. It follows from this that the major task which faces medical educators is that of making sure that each graduate is capable of learning from the wealth of experiences that lie ahead. Together with this ability there must also be instilled a desire to continue learning. For this to be achieved the characteristics of undergraduate learning need to match much more closely than is usually the case the ways in which successful practitioners learn from experience. In other words, it should be designed to call into play the same skills and attitudes which enable us to develop our competencies as professional people. All our endeavours as teachers should be shaped by this end

FURTHER READING


Fascinating account of a small group teaching method designed to encourage medical students to question some of their basic assumptions and to sharpen their ability to observe and interpret everyday and clinical phenomena.


Major study of the effects of the assessment system on students' approaches to learning and the carrying out of academic tasks.

Boud E (ed) 1985 Problem-based learning in education for the professions. HERDSA, Sydney

Valuable collection of accounts by practitioners of ways in which problem-based courses can be developed and introduced into the curriculum. Includes material on medical education.


Report of a research program into student approaches to learning and the extent to which these reflect teaching and assessment methods. Includes many quotations from interviews with students which provide insights into the ways in which they see themselves as learners and their interpretation of what is expected of them.


Although concerned with how young children go about learning this book contains much of interest to university teachers because its main focus is the ways in which learners respond to what teachers do. Very readable, perceptive and non-technical. Written by a practitioner.


Up to date and authoritative collection of papers reporting recent research aimed at determining the student perspective on learning and how this is influenced by the context in which it occurs. Includes valuable discussions of the implications of the findings for teachers.


Reports a study of how practitioners in the health professions view the significance and value of their undergraduate training in relation to their professional and personal lives.


Examines the relationship between teachers' beliefs about the aims of their teaching and the rather different views that students have of what they think is expected of them. Shows that the 'hidden curriculum' exerts a powerful influence on the ways in which students approach learning.


Comprehensive survey of research into all aspects of student learning. Valuable summary with many comments on implications for teaching. Extensive bibliography.