

post, sends comments off, and receives no other feedback than to see the article appearing in print later. Some journals routinely give the referee feedback, usually on the editorial decision and often including a copy of the other referee's report. Producing a good report, especially on a very technical paper, can take many hours, and editors do not seem to appreciate how rewarding referees would find the knowledge that their comments were taken note of and that the other referees agreed with them. A further concern is that some journals do not transmit the referees' comments to the authors; this wastes the referees' time and fails to appreciate that they want to improve published articles not just act as gatekeepers.

Final comments

The practice of editors varies substantially, and these points are intended to suggest that some simple changes could improve the ways in which they communicate about the process and their decisions. I would not want anyone to think that all my interactions with editors and referees have been unrewarding, many of my papers have been improved substantially as a result of the feedback I have received.

¹ International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. *BMJ* 1991;302:338-41.

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Medical Education

Making change happen

Stella Lowry

This is the last in a series of nine articles examining the problems in medical education and their possible solutions

The problems that have been identified in British medical education are not unique, and many of the proposed solutions have already been implemented elsewhere. Although new medical schools like McMaster in Canada and Maastricht in the Netherlands have had considerable success (in terms of staff and student satisfaction) with courses based on self directed, problem based learning, these models may be dismissed as difficult to implement in an existing course. One example of how major curriculum reform can be introduced into an established and traditional medical course is the recent experience at Harvard.

Harvard's new pathway

Harvard has a reputation as the premier medical school in North America, and the fact that it has chosen to introduce sweeping changes in its course is likely to make other schools take stock of what it is doing. I asked the dean, Daniel Tosteson, why such a successful school had decided to revolutionise its course. Like many recent reforms in medical education the changes had started with the dean's concern at the effects of the traditional course on the students in his faculty. He knew from interviews with students at entry and graduation that many were demoralised by the course. He did not think that they were adequately prepared for their roles as modern doctors.¹ In particular he thought that competence in computer literacy and manipulating information technology, which would help them to be "lifelong learners," were neglected. He was also concerned that the traditional course over-emphasised factual knowledge and paid too little attention to the attitudes that modern doctors need to develop towards their patients, their colleagues, and their work.

SEEDS OF CURRICULUM REFORM

The traditional medical course at Harvard was a postgraduate entry, four year one with the first two years spent studying the basic sciences and the second two devoted to clinical subjects. The main teaching method was the traditional large lecture. In 1979 the school hosted a "symposium on medical education," which sowed the seeds of curriculum reform in the minds of many of the staff. By 1982 the dean was proposing introducing a "demonstration project" which motivated students could enter (with no specific

academic prerequisites) at the end of their second college year. The course would run for seven years, at the end of which graduates would enter the second year of residency programmes. Within the course half the time would be allocated to a compulsory core curriculum and half to self directed learning. Basic and clinical sciences would be interwoven during the course, but with the clinical sciences predominating in the final three years.

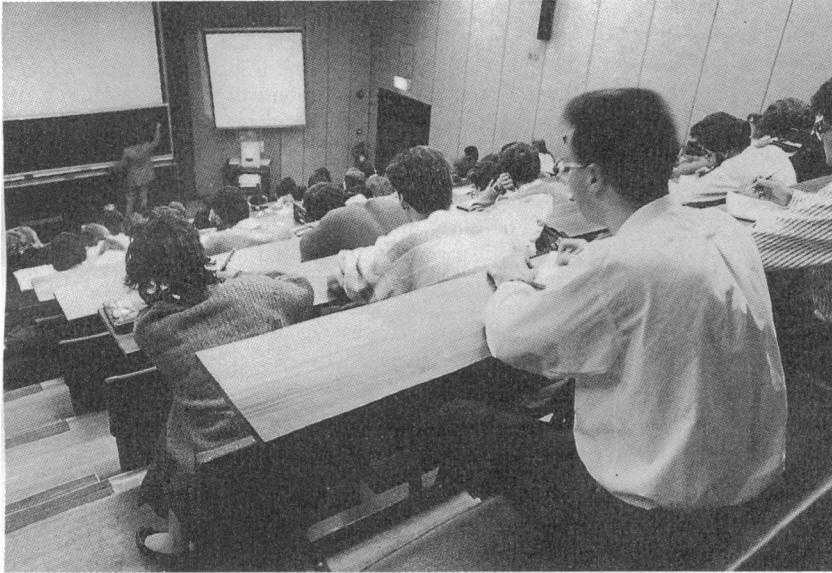
A report on these ideas appeared in the medical school newsletter and was picked up by the *Boston Globe* and the *New York Times*. The school soon found itself inundated with applications from college students around the country wanting to enrol on this innovative course.² In response to this enthusiasm Tosteson set up a planning group to design an acceptable curriculum for an experimental track within the school.

A major departure from his original vision was the rejection of a seven year course—but other concepts were accepted. The "new pathway" was to emphasise basic concepts rather than facts, topics were to be integrated, and clinical contact was to be introduced early. Initially there was considerable opposition from members of the faculty who feared that the proposals would undermine their own positions. Hence it was decided that the pathway should be set up as a small demonstration project only and be fully evaluated before its concepts were more widely introduced into the school. Guarantees of outside funding from sources including the Josiah Macy Jr Foundation, American Medical International, and Hewlett-Packard also smoothed the introduction of the scheme, which was not seen to present any financial threat to the traditional course.

In the new pathway the formal lecture time was reduced to 60% of the total available, the remaining time to be used by students to pursue topics that interested them. Most of the teaching was offered in small tutorial groups with close association between staff and students. Formal departmental boundaries were lost, and clinical teachers were involved from the beginning of the course. Each student on the parallel track was given a personal computer to use for electronic mail communication with tutors and other students and for access to bibliographic information. All students were also allocated to a librarian at the library of medicine who would help with the self directed parts of the course.

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BMA NEWS REVIEW

Medical courses are traditionally lecture based. This can be changed if there is adequate funding and an enthusiastic dean

EVOLUTION OF NEW SYSTEM

In 1985 all new students were invited to volunteer to study on the parallel track. Twenty four were randomly selected from the 70 who volunteered. These students were allocated to the "Oliver Wendell Holmes Society" and formed the first group of Harvard students to study under the new system. In 1986, 38 students were enrolled on to the parallel track, but during the next academic year something unexpected happened. Although the original intention had been to formally assess the new curriculum before deciding to extend it to the rest of the school, various forces came into play to ensure that by 1987 the entire 160 strong intake was studying the new pathway course. A major influence was undoubtedly the personality of the dean himself, but the essential catalysts were the decision by the department of anatomy that it could no longer continue to operate two separate curricula—one for the traditional course and one for the parallel track—and the decision by several of the charitable funders of the new pathway that future grants would be available only if the scheme was adopted throughout the school.

The atmosphere within the school was by then receptive to change. The special arrangements that had been made for the new pathway students had caused resentment among other students, who felt that they were being treated like second class citizens, and enthusiasm from staff members who had been involved in the parallel track had reassured other faculty members. Dr Myra Ramos, the associate dean of educational services, thinks that the sudden explosion of the new pathway would have been impossible if Tosteson had been too cautious in his original plans. She believes that any attempt to negotiate an acceptable package for the whole school from the start would have resulted in "minimal change at the margins only." The apparent safeguards inherent in a small pilot project enabled very ambitious changes to be accepted and meant that when the whole school converted to the new programme the change was indeed radical.

One disadvantage of the departure from the planned scheme was, of course, the loss of the opportunity to compare the new pathway students with their colleagues continuing on a traditional course. The new system ran as a parallel track for only two years, and all of the students were volunteers. What evaluation was possible suggests that the new scheme works well. The new pathway students were not identified by tutors in the clinical clerkships, and unreported data collected by Dr Gordon Moore, who coordinated the intro-

duction of the scheme, suggest that new pathway students tended to be assessed as rather better than those who had come through the traditional route. Certainly the first cohort of new pathway students did well in the national board examinations after graduation—but this was a self selected group, who might have done well anyway.

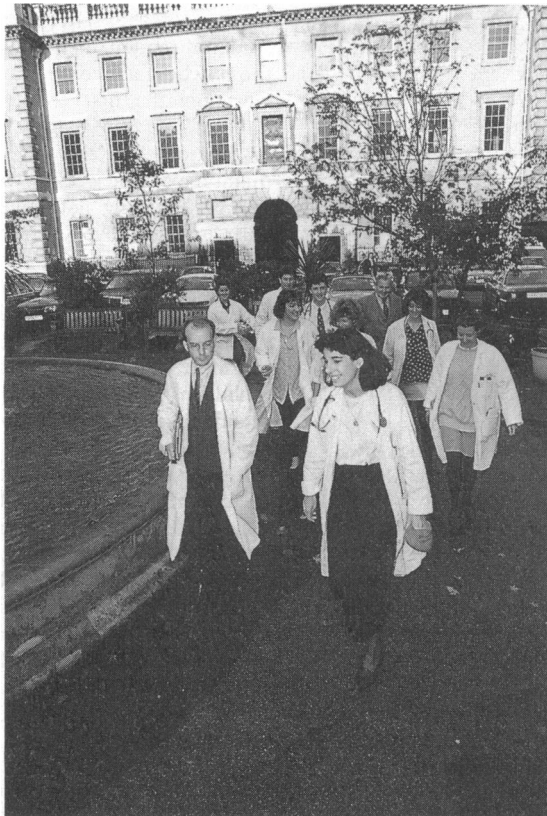
An interesting natural experiment arose when the entire school moved over to the new pathway course in 1987. Students due to enter the school that year had already been asked to volunteer for the parallel track, so two cohorts existed—those who had expressed a preference for the new approach and those who had not. The design of the first year curriculum included mainly a problem based approach, but one course retained a traditional lecture based format. The students' performance on the problem based and lecture courses were not found to correlate with their preference for type of course, and those who had not volunteered for the new pathway did as well as those who had, even on the problem based sections of the new curriculum.³ Although harder data on the effectiveness of the new approach are not available, there is a feeling at Harvard that staff and students are happier in the new atmosphere. As Dr Ramos told me, "There comes a point where faith and conviction are more important than hard data."

Must change be all or nothing?

Harvard could implement sweeping changes in its medical curriculum because it had a forceful dean and access to large grants to fund a very ambitious project. During my researches for this series I have met many people who, though agreeing with the theory behind the reforms of British medical education proposed by the General Medical Council and other bodies,^{4,5} do not think that reforms can be implemented on a wide scale. Although schools like St Bartholomew's in London have succeeded in introducing innovative curricula, this is often attributed to the personal skills of the dean and local enthusiasm rather than to anything more generalisable. Can change be introduced in ways that most medical schools would find acceptable?

Dr Colin Coles, an educational psychologist from Southampton, is a firm believer in change through evolution rather than revolution. He cautions against assuming that the only ways to implement effective reform are to start from scratch (as with McMaster's course, utilising problem based learning in small groups)⁶ or to adopt wholesale change as at Harvard. He suggests that the end product of medical education should resemble "a well stocked library capable of updating and cross referencing" and emphasises the importance of "elaborated learning," in which students find that what they learn in various parts of the course "fit together" into a useful, coordinated whole that they can continue to use long after the relevant examination is over.⁷

Although adopting an integrated problem based course may be one way of achieving elaboration,⁸ Dr Coles believes that such radical approaches are not essential. At Southampton dramatic effects on students' ability to elaborate have been achieved by changing the timing of their examinations.^{9,10} At Southampton the students sit a traditional 2nd MB examination, which tests their knowledge of basic sciences. But unlike most schools which set the 2nd MB at the end of the second year of the course, before the students start their clinical studies, Southampton has moved the exam to the end of the third (first clinical) year. The students find that the basic sciences "make sense" when they come to revise them in the light of some clinical experience—as one student stated recently: "It's not so much revision as vision."



NEIL TURNER

Ultimately the strongest driving force for change in medical education in Britain must be the students and young doctors themselves

Making change happen

The GMC has announced that our system of medical education must change.⁴ There is a wide consensus among medical educators and students about the need for change and the direction it should take,⁵ and there are plenty of examples from Britain and elsewhere that change is possible and can be effective. But how can we ensure that action results from all of the recent rhetoric? The enthusiasm of staff and students in places like McMaster confirms that techniques like problem based and self directed learning can make medical education an enjoyable experience without loss of quality in the end product. The sweeping changes that have occurred recently at Harvard and the new basic sciences curriculum at St Bartholomew's Hospital, London, prove that change can be implemented in long established traditional medical schools if there is adequate funding and an enthusiastic dean. The researches into medical education going on at places like Southampton and Dundee confirm that smaller adjustments to medical courses can have useful effects on how students learn. Changes in the provision of health care and increasing awareness of the demoralising effects of our traditional system on the students going through it are driving changes, and we may be poised on the brink of a steep acceleration in the number of schools willing to make radical changes in their courses. But we must ensure that changes are implemented quickly and on the scale needed to address the current problems.

The ultimate responsibility for reforms in medical education rests with the education committee of the GMC. Although the committee is to be congratulated for its lead on the need for change, this will be worthless unless it is willing to ensure implementation of those changes. The GMC does not have a good track record in ensuring that change happens. This is partly because the council has limited means of enforcing its recommendations, short of the draconian removal of recognition from an entire course. If, however, the

council is serious about the need for reform it must be willing to find innovative ways of enforcing its recommendations. Although the few schools that have introduced changes seem to be enthusiastic about them, wider implementation will require sticks as well as the nebulous carrots of increased staff and student satisfaction.

INFLUENCE OF MEDICAL STUDENTS AND YOUNG DOCTORS

The GMC may have its hands tied in terms of the disciplinary action that it can take itself, but it is in a position to collect information that could be used by other interested bodies. Mr Richard Wakeford, senior research associate at the University of Cambridge School of Clinical Medicine, has already conducted a series of surveys into educational practices at British medical schools for the council, but the results have not been made public (R Wakeford, personal communication).

Dr Chris McManus, from St Mary's Hospital Medical School, London, suggests that the GMC should routinely collect information from medical students about all aspects of their courses. This should not be a formal response during the education committee's infrequent assessment visits to a school but should be a regular, in depth assessment of the type of teaching and general experience provided on each course. The GMC is in touch with all final year medical students and house officers when they apply for provisional and full registration, and it would be a simple administrative matter to require applicants for registration to complete an anonymous questionnaire about their educational experiences. This information could be used as the basis of a "good school" or "good house job" guide, allowing students themselves to influence the educational experience by voting with their feet against poor courses.

Ultimately the strongest driving force for change must be the students and young doctors themselves. Individually, medical students and young doctors have little power, but collectively they can be more influential. The falling numbers of applicants to study medicine may force schools to think again about the courses they provide. Recent changes in primary and secondary education in Britain, with increasing emphasis on project work and self direction, may encourage school leavers to seek out courses that continue these approaches. Organisations like the GMC and the BMA should provide students with the information on which to base such choices. They must be empowered to demand excellence in the courses that they attend and realise that their education is not a favour to them but a means of preparing them to be the sort of doctors that we want in the future.

I thank the many people who helped in my research for this series. In particular, I thank Dr Angela Towle, of the King's Fund Centre, for comment and advice at every stage.

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