

Recent Developments in Distance Learning

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'DISTANCE LEARNING' usually refers to educational activities in which the participants are geographically separated, but linked by technology. It is playing an increasing role in medical education not only because of its economic use of resources, but because technological advances have extended the range of methods which are applicable. In particular, video conferencing and systems which allow text, images or data to be digitised and transmitted have given the teacher a repertoire of techniques which more closely resemble those available in the lecture theatre and in some cases exceed them. For example, students may now observe television close-ups of a procedure carried out at a remote site by an authority in the field and may ask questions. The presentation can be supplemented with illustrations from computer files of medical images, patient data or other material. This paper considers some recent issues in distance learning as they apply to medicine and gives examples. It is not intended to be an exhaustive account of what has become a complex and disparate field. In addition, consideration is given to professional concerns arising from the use of modern methodology.

Bates [1] has reviewed the range of technology available and notes that methods may include audio and video conferencing, computer conferencing and teaching by telephone. Electronic mail allows the participants to leave short letters for each other and to have access to information sources such as bulletin boards and computerised medical abstracting literature under the guidance of their teacher. It can also be used for submitting essays and other written work for assessment. The student transmits a text file and the teacher can make comments and amendments directly onto it and return it to the student. Both land lines and satellite links can be used to transmit the data. While purists try to avoid the use of old technology in the shape of printed materials, it is nevertheless vital that students receive sufficient ancillary material to help them to understand what is presented electronically and that, in particular, they still achieve expertise in extracting and summarising material from written texts and in note taking.

If the objective of medical education is to transfer both knowledge and skills to students as well as to socialise them in professional standards and traditions, then distance learning techniques must be measured against the achievement of these objectives. There is a danger that the novelty and attractiveness of the techniques, particularly in the hands of enthusiasts, may dominate or distort educational ends. Moore [2] has pointed out that any educational programme should start with the educational objectives, and only secondly consider the methods necessary to achieve them. On this basis, distance learning may be rejected if it fails to meet requirements. He notes that there has been a tendency for distance learning to be used for instructional situations which would more commonly be regarded as training. These tends to involve the learning specific skills rather than the understanding of more general principles.

Success in projects of this kind may tempt educators to generalise the method to other, less appropriate contexts. A further perspective on this problem is offered by Reigeluth and Curtis [3] who suggest that priorities can be assigned to cognitive goals (involving knowledge and skills), skills goals (involving the physical performance of tasks) and affective goals (involving the development of feelings, attitudes and values). The education of health care professionals has tended to place weight on this last group and the exact impact of distance learning in affective matters is not yet clearly established. Despite these reservations, distance learning has been of demonstrable value in medicine and a number of experiments are under way.

In many medical contexts it is difficult to separate teaching from clinical practice, since discussing cases with more junior or less experienced colleagues necessarily involves an instructional element. For example, Higgins, Conrath and Dunn [4], who were examining the uptake of telemedicine systems in rural Ontario, Canada, found that in the case of a slow-scan video system, 38% of the usage was for overt teaching purposes. In cases where paramedical staff are involved, the instructional element may constitute a necessary precursor to any action and this is particularly likely to be the case when the system is set up in a rural or third world context. Memorial University, St. John's, Newfoundland has pioneered links between first world centres and practitioners in countries such as Kenya and Uganda. The use of satellite links has greatly enhanced the access of colleagues in Africa to specialist advisors in Canada [5]. This work has been based on earlier systems successfully operating on a service basis in northern Canada. Indeed, it seems likely that the drive to establish viable service delivery by remote consultation may be an important factor in developing a subsequent distance learning approach which sets realistic tasks and priorities for students and motivates them to persist. There is otherwise the temptation to concentrate on specialised research areas which may be of chief interest to the originating team in the project and which are not seen by the students as important to them in their working environment.

As part of a 4-year European Commission project (RACE 1086 'TELEMED') United Medical and Dental Schools of Guy's and St. Thomas's Hospitals, London, have set up a low cost video conferencing link between an acute ward at Guy's Hospital and a psychiatric day hospital sited approximately 6 miles away in a multi-disadvantaged inner city area. The link involves prototype equipment and consists of a dedicated leased line which allows the transmission of digitised video. Each end terminates in a personal computer which displays a head and shoulders picture of the person at the other end in a window on the screen. The picture is less refined than that used in conventional broadcasting, having 128 by 128 pixels, 64 grey scales and frame rate of 16.6 frames. The system has been used extensively for clinical activities, including entire unselected outpatient clinics in which the doctor is at Guy's and it is also used for the teaching and supervision of staff based at the day hospital. A similar system is installed at the Ville Evrard Hospital in Paris. The London system has been used to train junior doctors, to supervise clinical psychologists, to provide advanced

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training for a multiprofessional rehabilitation team and to supervise students in mental health nursing. Comparable groups took part in Paris. Both behavioural and self-report measures have been taken and results so far in both countries indicate very positive reactions, particularly by junior staff. Senior staff tended to regard some tasks as sensitive and avoid them on the videolink. The addition of a document camera to transmit written material would be of considerable value. At present it is faxed using a separate line. This research is taking place in TELEMED's more general context of remote diagnosis and consultation, other aspects of the work elsewhere in Europe being concerned with the transmission of digitised medical images and patient data.

Systems of the kind described in the above examples give point to considerations about ethical, legal and cost-benefit issues. Since distance learning in medicine is frequently case-based, confidential information is likely to be much more widely disseminated than in a conventional teaching situation. The teachers and students may not be as well known to each other and the usual checks and balances operating in particular institutions may fail. Obtaining informed consent from patients for the storage and transmission of information about them by electronic means is only the first step. Even within the European Community there is not yet legal harmonisation in relation to patients' rights with respect to electronically stored data. International distance learning initiatives may encounter conflicting legal positions when patient data are transmitted across national borders. The necessity for encryption of patient data transmitted on public telecommunications networks is obvious to health care professionals, but is not always obvious—or regarded as a priority—by the operators of the systems. At its

best distance learning in medicine should improve quality of care and save money. Both quality and savings have proved hard to define, in this as in other contexts. However, progress on such definitions is essential if adequate investment is to be made in the initial system costs without which a start cannot be made. More information is also needed on how to make a modest start using the most appropriate technology. The current literature often verges on the esoteric, or perhaps simply reflects the enthusiasms of individual practitioners who have an affinity for communications technologies.

The next 10 years are likely to see a substantial drop in the costs of equipping a distance learning programme with the technology required. Telecommunications costs have frequently proved a barrier, but here again greater competition is likely to make them more realistic for medical users. The opportunities for tailor-made programmes would therefore appear to be substantial.

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