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SIMULATION AND GAMING
FOR THE 1980s

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GAMING AND SIMULATION
IN EDUCATION AND TRAINING

6. Teaching with simulations and games in the health sciences: the potential of an undeveloped area

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Abstract: Health sciences educators need to devise strategies for the learning of skills, information, principles and problem-solving. The student level may range from the relatively unskilled aide with a low level of literacy to the experienced post-graduate practitioner. The clinical practice areas are becoming increasingly complex; the growing number of students coupled with a rising concern about legal liability and patient rights make it imperative to find alternatives to traditional real-life clinical instruction. Some beginnings have been made in producing materials suitable for student nurses, doctors, rehabilitation workers and others, but there is a need for much greater development and distribution of materials and better understanding of their use by educators.

This paper will briefly review the state of the art and the scope of available materials for health sciences education. It will outline the most promising areas for future development and will discuss some possible strategies for overcoming distribution difficulties and other major problems in the field.

Introduction

I am writing this paper from the perspective of a nursing educator, addressing a challenge as well as some suggestions to my colleagues in education who have an interest in simulations. We in the health professions need your help.

There are some pressing problems in the education of health care professionals today. Since these problems ultimately affect the performance of nurses, physicians, physiotherapists, dieticians and the myriad of other health care specialists I hope that your own enlightened self-interest will enable you to see this as your problem too.

Problems

SAFETY

Paddington bear, when told that his dentist had been 'practising' for years, exclaimed 'I think I'd sooner pay extra and have someone who knows what he's doing' (Bond, 1973). No patient wants to be 'practised on' in the sense of providing a 'learning experience' for a fumble-fingered student. No instructor wants to be responsible for patient safety when care is being provided by inept students. In hospital care new technology is becoming increasingly complex; there is more possibility for error, and more serious consequences of error. How do we provide opportunities for student learning without risking patient safety and comfort?

INFREQUENT OPPORTUNITIES FOR USE OF SKILLS

There are infrequent opportunities for the use of skills with a consequent 'forgetting' and lack of swift and sure response. The patient whose heart suddenly stops beating can often be resuscitated to live many more happy and productive years if the right action is taken promptly and competently. Despite what you may see on the television shows such dramatic events do not happen often and individuals who have been well prepared to handle such an emergency can lose their skills through lack of practice. How do we provide opportunities for students and existing staff to retain crucial skills when opportunities for practice are limited and infrequent?

ETHICAL CONCERNS AND PATIENT RIGHTS

We have become more sensitive to the need not to intrude unnecessarily on a patient's privacy in order to provide opportunities for students to 'see an interesting case', practise a skill or take a history. As an educator I am more frequently being told that hospital units are being overloaded with students and that I will have to make other arrangements for my students' clinical practice. Ethical issues are difficult to teach, in that real-life situations are often complex and students have few opportunities to exercise independent judgement in these areas.

EMPLOYER CONCERNS

There is a concern that new graduates should be able to practise competently after the briefest of orientations to their new jobs. How do we reconcile this demand for expertise with the more limited opportunities for clinical practice cited above?

ADMINISTRATOR (AND TAXPAYER) CONCERNS

There is concern with the high cost of education programmes for the health professions. This concern with rising costs will preclude either lengthening of programmes or lowering the student/instructor ratio as ways of meeting the above needs. It also pushes us towards a greater concentration of students rather than their disbursement in smaller urban or rural centres.

THE EXPANSION OF KNOWLEDGE IN THE HEALTH CARE FIELD

Except at the most basic level we cannot teach just the facts; we must teach principles and expect the student to apply these principles appropriately in a variety of clinical situations. How do we provide learning experiences so that students can begin to make the transition from classroom to real world?

HOW DO WE TEACH IN THE AFFECTIVE DOMAIN?

It has become clear that, however technically skilled the health professional, technique is not enough and that empathy and other appropriate affective responses are critical to good care. These cannot be taught by lecture and

discussion only. Traditional wisdom is that 'attitudes are caught, not taught' but that approach to learning takes time — time which we do not have in today's high pressure programmes.

SIMPLIFYING COMPLEX SITUATIONS

How do we simplify complex situations so that we as instructors can devise appropriate learning strategies — particularly when the real world of clinical practice is beyond our control? The instructor trying to find suitable patient assignments for his or her beginning students may be on a ward which has a large number of recently admitted critically ill patients who require complex care, rather than an appropriate number of convalescent patients. What alternatives does the instructor have in devising simplified learning experience for these beginning students?

HOW DO WE EVALUATE STUDENT CLINICAL PERFORMANCE CONSISTENTLY?

For an instructor, the difficulty of evaluating student clinical performance is often complicated by the diversity of student assignments. How can we provide a standard situation on which to evaluate student performance?

Solutions

I think that well-prepared simulations and learning games could do much to help. Unfortunately developments in this area have been very slow and uneven and there has been little documented research regarding the effectiveness of those simulations which do exist. It seems that many interested educators are developing materials for their own use but a lack of consistent large-scale testing with various groups and the lack of commercial availability of materials is hampering development. What can SAGSET and the combined wisdom of its members suggest?

I should point out that the health professions education system is not an insignificant market — or at least potential market. In addition to the thousands of health profession students now taking various educational programmes there is a large need for materials suitable for in-service or continuing education programmes for practising professionals. In some professions and jurisdictions such continuing education is now mandatory — at the very least most practitioners and employers recognize continuing education as desirable.

To give you some idea of the present state of the art, recently I was involved in the preparation of a review article on health and health care simulations (Zelmer, A E and Zelmer, A C L, 1980). A review of all the materials to which we had access and bibliographic searches in both simulations and health care literature yielded only 65 possible items. Many of these were eliminated almost immediately because I was unable to obtain sample copies for review; we ended up with less than 25 items currently generally available in the health and health care field for review. Given the diversity of levels and number of possible subject areas which might be approached this small number does not even provide an adequate sampling to introduce other educators to the possibilities of simulations as a teaching method in the health field.

The best developed materials to date seem to be the physical models, such as

'Resusci-Anne', which provide feedback to the student on his/her performance (Penta, F B and Penta, M Q, 1975). These may be expensive to develop and produce but provide a safe method of practising psychomotor skills not otherwise available.

A number of other games have been developed to provide practice with vocabulary and factual information (Dempsey, 1973). These are more useful for out-of-class practice in technical and professional education but can be useful group learning activities for community health or patient-teaching. I suspect that many more of these materials have been developed by individuals for their own use, but are not generally available. Could SAGSET be a facilitator to collect and publish an anthology of this material?

A number of attempts have been made to provide health science students with an understanding of individuals who have sensory impairments (Dahl, 1976 and Hickey, 1975) or age-related conditions (Kastenbaum, 1971 and Ann Arbor, 1975). One simulation has looked at the issue of approaching death (Herrold, 1975). Another type of simulation which is beginning to be more widely used in health teaching is the 'programmed patient' or 'surrogate patient'. In this case live healthy individuals are coached to role-play a patient with a particular diagnosis (Barrows, 1972) and/or to provide feedback to students on their physical exam or history-taking procedures (Lincoln *et al*, 1978).

Variations on the clinical simulation are those requiring only pencil and paper (McGuire *et al*, 1971). Sometimes called 'active case studies', these are really branching programmes with a variety of information available prior to each decision point. While the initial preparation is quite time consuming, once developed there would again seem to be a considerable scope for sharing materials.

Simulations have been used for student evaluation, but not frequently — or at least there are few reports on their use for this purpose (de Tornay, 1968, Grover, 1972 and Kubo, 1971). Perhaps this is because the development and use of a testing simulation requires a great deal of thought and time to administer.

Other types of simulation in the health care field seem to deal chiefly with aspects of administration or organization of the health care system. These are perhaps more difficult to use widely, since they are often specific to a particular system. While the principles of ward management may be the same in Britain, Canada or the US, the 'translation' required for terminology and titles means that the simulations cannot be used elsewhere without a good deal of adaptation. For example, BARBARA JORDAN is an in-basket type simulation for a director of nursing service (matron) set in an American hospital; it can be used with little or no adaptation in Canada, but would require some changes to fit most UK hospital systems. BLOOD MONEY (Greenblat *et al*, 1976) is an excellent simulation of the health care system in the US as it affects haemophiliacs, but because of differences in organization it requires quite a bit of adaptation for use even in Canada. Simulations dealing with ethical issues may also be sufficiently culture bound as to require significant adaptation for use in a different setting.

What I am suggesting as a response to this situation is a three-fold approach to the development and testing of simulations and learning games in the health care field.

First, a collaboration between those who have expertise in the health care field and those who have expertise in the design and use of simulations.

Second, a distribution system to permit the more widespread use of materials.

This is obviously a complex question requiring the help of entrepreneurs among us. It will also undoubtedly require some financing, and I wonder whether the various health agencies might not be interested in helping to develop and test materials which would meet some of their needs. If we think of the parallel of film production, distribution and use we should perhaps not be too pessimistic since it has taken over 30 years to develop an effective distribution and production system.

Third, an organized evaluation programme so that we can begin to speak with authority (rather than only hunches) about which teaching situations are most suitable for simulations and which simulations are most effective. There has been little organized research on simulations to date. In a reasonably thorough search of the literature I was able to find only five articles evaluating health care simulations (Galihier *et al*, 1970; Hoffman and Abrahamson, 1975; Ingwell, 1973; Penta and Kofman, 1973; Tinning, 1973).

Summary

Simulations and learning games would seem to hold promise for a teaching strategy and for evaluating students in the health professions. There are many pressing needs to expand clinical experience for students which cannot be adequately met in the real world. This potential is unfulfilled at the moment because there seems to be no effective way of linking up experienced simulators and nurse educators; there is no effective distribution system for existing materials and there is little concrete evidence regarding the effectiveness of this strategy.

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7. A MINERS' STRIKE, 1972

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Abstract: This simulation has been run annually for three years for second-year social studies students. The two main motives for initiating the exercise were: (i) the interdisciplinary content of the degree was, it was believed, inadequate, and (ii) teaching methods in the department were truly in a rut. Based on a scenario, which combines past economic realities with a hypothetical political situation, the exercise can be run in several ways: from a short and intensive negotiation between the NUM and NCB involving 15-20 players to one involving 13 teams representing various institutions and up to 90 players over two days. Communication between the teams in the bigger exercise is primarily by 'letter' or 'telegram' but face-to-face meetings may be organized. In addition, some players are members of two teams by virtue of their roles. Debriefing takes place in two stages: first within teams and second in a plenary session. In the latter an attempt is made to combine students' contributions with those of the staff who constituted Control during the exercise. The most