

The Role of Nurse Education in the Integration of Information in the Health Care Environment

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The central theme of the paper is to explore the issues surrounding the development of European-wide knowledgeable nurse practitioners for effective and efficient patient care in an information intensive health care environment. Examination will be made of the role education needs to play to complement the new paradigm of health care. Where practicable, comparisons will be made between nurses' and other health care disciplines' approach to the introduction of information systems and how 'shared' approaches could be beneficial to all professions and the patients in care. The paper will conclude with a vision for the future and consideration will be given to where European nurses should position themselves to remain accountable and autonomous practitioners in health care.

Introduction

"In healthcare there is an increasing need for effective information management to be able to make optimal use of the rapid developments in the area of care, science and organisation."¹

If it is accepted that humans manage information from an early age to death, then why is it that we tend to dismiss the role a computer plays in information management as 'technical'? A rhetorical question and one that could be answered thus:

The direct approach used by computer systems of Input-Process-Output does not match the complex sophistication of human information systems.

We can see around us, both within and without the health care settings, computer systems which are of little practical benefit to users. Classically these tend to be directed from the top down, show poor user involvement and are rigid in their approach to the work required. These systems tend to be replicas of the original paper process in a 'mechanised' form. Mechanisation follows a dedicated path without examination of information need or recognition of different 'value sets'.

It would be wrong to suggest that all computer systems are poor, indeed many are satisfying user needs extremely well, but in health care we remain with the majority of systems disliked by staff and poorly used. Major investments from health care have been placed in computer systems, most of which are mechanistic in their approach and tend to be insular to a particular working practice, such as finance, theatres, pharmacy, pathology or stock control; or to a particular group such as nurses, doctors, administrators. The matrix, should it ever be drawn, of the barriers placed between the working practices and those working in/with them might be quite informative.

A recent example of a technological system satisfying a need is that of the UK National Lottery. The telecommunications infrastructure was in place to permit the wide distribution of terminals in all manner of retail outlets. With each corner turned in any town, village or city across the UK there is an exceptionally high chance of seeing the National Lottery sign denoting an outlet. Each outlet is directly linked to the central computer system, showing sales, ticket number selection, winnings, types of ticket sold etc. Imagine the information management system used as the basis of the infrastructure design which would meet the high level of demand by users. The National Lottery information systems design is user driven and has been designed around the needs of the user with the organisers obtaining their information from day to day activities, this is 'computerisation'. Computerisation allows each 'value set' to be addressed.

Computer technology will not go away, it may become more acceptable to general users, but the central processing unit will continue to play a pivotal role in systems used for managing information. It is likely that the future will offer smart card technology for patient records, indeed for all people records from immunisation through to allergies, from school records through life long learning, from birth details through life long health records. The central feature in health care of the patient has ensured the development of the Electronic Patient Record where all disciplines are able to add information without insularity. The emergence of the health care power base in the UK as the community practitioner will ensure that user needs are met in care delivery and support for health promotion, there will be a swing away from hospital information support systems (HISS) towards community care monitoring and purchasing systems.

Alongside these changes, the future is likely to require a change in the boundaries of health care practitioners. We can already see the possibilities for change to the medical role following a reduction in junior doctors' hours in the UK. Nursing too is changing and becoming accountable providers of full ranges of care from clinical triage through to discharge. The future is bright if only we can grasp the most effective way to manage the information of care and health promotion.

The key to the future in health care information management requires examination of the information 'map' as distinct from the managerial map. The only way to effectively achieve such an examination is to prepare practitioners with information management skills rather than computer or keyboard skills.

Information management

It would appear as though the optimum solution for the preparation of practitioners ready to work effectively in the emerging health care environment is to instruct them in information and its management rather than information and its technology.

The start point must be a model of information which is people-based in its application and yet can embrace the support of technology, one such model ² is diagrammatically shown below.

In this model, all the cog wheels are turning all the time. Information flows in and out of the central cogs all the time and movement across and between all the cog wheels occurs all the time. The jagged line denotes value laden information, the straight line denotes bland information such as an anatomy book, where a diagram of an arm is just that with no inner value other than a diagram of an arm. The acquisition cog, turning all the time, permits

passive and active information input. The processing cog determines whether the conscious or subconscious parts of our brain need to deal with the information, for example, as an adult opening a door is seldom in conscious thought because we know how to open a door, conscious thought is only required when the door does not open and we read 'pull' and we have been pushing. The processing cog is the 'filter' based upon what is important to us, or valued by us. The storage cog represents the conscious human, the life and learning that has gone on before. The dissemination cog represents the pathway for communication, either internally for self growth or externally with personal value sets added.

What is required in nursing and health care generally, is a re-definition of nursing and a definition of our 'value-sets'. We need to decide what is important to nursing and health care in this information intensive era and how we are going to prepare those starting, returning or continuing nurse education who will practice well into the next millennium. We need to know how to filter information to meet the needs of our value-sets. What we don't need are replacements for clinicians and teachers by mechanistic computer systems/packages which have neither the humanistic understanding nor the flexibility to respond to need in a supportive human way.

The future depends upon the direction human enterprise, creativity and innovation determines it should go. There is a saying, which I totally support, *The only certain way to predict the future is to invent it.*

Within nursing there will be major implications following further movement into the information society, the education of nurses must be fully able to adequately prepare nurses to act as the information management advocate for patients and clients and to use all the learning resource tools at their disposal.

The role for education

Computer technology has been used across the health service in the United Kingdom since the mid 1960s, and yet we are still contemplating the development of curriculum integration of Information Management and Technology (IM&T)³. In observation of teachers' use of computers, it does appear as though the majority have not yet moved passed the 'typewriter' stage. Fingers on computer keyboards, characters painstakingly pressed out viewed on the screen, layout and emphasis (bold, underline, etc.) done during the initial preparation of the document, isn't this the development of typing skills rather than the development of information management skills which can be disseminated amongst the student population? If the majority of teachers are at this rudimentary stage of technology use, then it is quite understandable that IM&T has not developed within nurse education.

We, in nurse education must get our act together and undertake the role of education within today's and tomorrow's society or we are disadvantaging our students. We must lead, not catch up.

There is an information technology continuum upon which we should all position ourselves. At the one end is information, where those positioned understand personal and professional value sets of information, its acquisition, its filtering (conscious and unconscious), its storage and its dissemination. At the other end is technology, where those positioned are fully versed with all manner of technology and are able to effect its use with competence. In the middle, are those positioned with the ability to have insight into information management and an insight into the possibilities of technology probably without the skills to effect such

possibilities. At all times, whilst positioning ourselves on the continuum, we must be aware of the professional needs of education and prepare ourselves to meet and surpass those needs.

Does Mrs Smith, admitted yesterday for a hip replacement operation expect a nurse to be skilled in word-processing, or does she expect a nurse to be skilled in information management? I would suggest the latter, although the words used by Mrs Smith may not be as above, more likely she will ask questions such as, *'This will help my walking won't it nurse?'*, *'I won't have too much pain after the operation, will I?'*, *'It is only two years since I was last in this hospital but everything seems to have changed.'* And *'I have no family who can come and collect me when I'm ready for discharge, how will I get home?'* The nurse must know how to obtain answers to these and similar questions and how to record any information outcomes from her answers.

*'An educated workforce learns how to exploit new technology, an ignorant one becomes its victim'*⁴ Are we exploiting technology through education or are we merely using the technology in a mechanistic fashion so that we are becoming disillusioned slaves to the technology?

The key to the future is the method and content of courses preparing health care practitioners. No longer will it be the case of 'nursing' or 'medicine', the development of shared multi-disciplinary education will become common place, driven not only by professional desires but also by sound practical economics. Many are turning away from banks of computers in a laboratory to open access distributive learning anytime, anywhere through national and international telecommunications networks⁵ argued,

'Learning technology is not chiefly concerned with using computers, video recorders, audio tapes or any other form of technology. Rather, it is concerned with a systematic approach to the planning and delivery of the educational experience. In other words, it should be more concerned with the design of the whole learning experience than with any particular delivery medium. For good design, it should be clear how best to deliver a quality learning experience.'

As the global communication barriers are removed by technology, we must position ourselves as major components of shared resources and shared curriculum. Dwyer⁶ supports the concept of sharing, he suggests four areas of concern which need to be addressed,

1. The importance of having a 'shared vision of the future', and having the support for changes from the community, administration, teachers and learners.
2. The beliefs and practices of the teachers, their operating philosophy. How do they consider learners.
3. What should the curriculum look like to prepare people for the 21st Century. Can alignment of the curriculum be achieved to form connections and linkages across disciplines together with the melding of important personal qualities? Can integrity, academic rigour and the expanding levels of information be accounted for by using interdisciplinary approaches?
4. Is there a preferred method of instruction that can maintain high learner interest and activity, and ensure optimum learning results?

It is likely that the whole image of the professions involved in health care will change as the 21st Century unfolds. Nursing will be different, exactly what those differences will be is, as

yet, unclear, but direction could be taken from the growth in specialist practitioners and the enhancement of knowledge and skills within a particular domain.

The future of health care education, as we are identifying at the University of Sheffield, School of Nursing and Midwifery within the Faculty of Medicine, is multi-disciplinary, multi-cultural, specialism focused with autonomous practitioners adding to their knowledge through whatever means are most suited to their needs. External to the Schools within the Faculty, with which we are collaborating strongly for joint curricula, are academic areas such as Information Studies, Computer Science, Social Sciences, Management and Business Studies. The opportunities offered across any University campus are vast and can significantly expand the preparation of nurses to meet the challenges of the 21st Century.

In 1989, the UK Department of Health published 'A Strategy for Nursing' in which the following paragraph should be included in our thoughts, *'Accountable practitioners must be more than passive recipients of information. They will need to acquire the analytical skills to ask the right questions, to know where to seek answers to them, and to reach informed decisions on the basis of the fullest knowledge available.'* Let us take heed from the contextual direction afforded by national initiatives.

We must be visionary in our preparation of courses to meet future health care direction and health care practitioner's needs. Tradition is changing and what is current practice will disadvantage health care practitioners of the future. A completely new paradigm is required and one that accepts change as a major focus. The tools for our trade are out there in the present creativity of teachers, clinicians and students themselves, let us not constrain their initiatives through placing 'safety' barriers in the way of progress. Let us not merely select chapter headings for informatics across curriculum, we have an exciting opportunity to really prepare practitioners for the work ahead supported by technology.

Let us not bury our heads in the sand and hope that this new revolution will go away, Peterson in 1992 stated, *'We should not be asking ourselves, as educators, what is the cost of modernising our education system, rather, we should be asking what will be the cost if we do not.'*⁸ New delivery media present us with even greater challenges, as stated by Sangster⁹ *'World Wide Web has the potential to alter permanently the way in which academics teach and students learn.'*

Within curricula we must secure the impact of the Web through identifying knowledge gain from student access. We must have a reasoned approach to the use students make of the information sources. Does this mean we constrict their routes of access, or does it mean we must have measures available to determine knowledge gain following use of the Web? Within our School, we have already noticed a marked change in the referenced materials to student assessments, it is slightly strange to have a reference to a Web address as part of the referencing system. The growth of informatics/telematics has been staggering, we must take heed of the strength and apply this towards effective practice and improved patient care with nurses who understand information management and move beyond those who suggest technology is there to support current practice translations onto computer systems.

Nursing needs to be released from its traditions, it needs to find its new 'order' and needs to stake a significant claim in the power base of health care. Integration of information in the health care environment will not happen without major re-thinking, revision and

implementation of the new paradigm, that of people-based information management. Nursing needs to regain its power.

*'Power is control, influence or the ability to do or act. Power is the ability to make decisions and power is determining what those decisions will be in the first place. Power is having control of information.'*¹⁰ A recent article in the UK Health Service Journal described a vision for health care in 2020 ¹¹which clearly ascribed a significant role for nurses through statements such as *'popularity of the nurse led poly clinic network'* and *'The surging confidence of nurse practitioners'* The role of primary information manager for health care is open to nursing and education must prepare nurses entering the 21st Century to operate that role to the best of their ability.

A note from our medical colleagues may point the way for learning and teaching in the next millenium,

*"Given the complexity of the domain of medicine and the variability of computer-based applications, there is a need for a comprehensive framework to guide the development and use of learning technologies in medicine. Most computer-based instructional tools build on idiosyncratic methodologies, and are driven by immediate interests and specific needs. There is a need to merge approaches into unifying paradigms towards different kinds of learning."*¹²

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