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The focused use of posters for graduate education in the complex technological nursing environment

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Posters are increasingly recognised as both a method of professional communication and a strategy for learning and assessment in nurse education. Rapid technological developments in health care and the nursing practice environment are generating specific educational needs in relation to the use of technology. There is a move to incorporate within the traditional rational technical focus a broader, more comprehensive understanding of technology, technological equipment and procedures. Technological innovations are an ideal subject matter for poster presentations at the graduate level particularly as broader dimensions such as the impetus for introduction, the research base, the evaluation strategy and the cost can be incorporated. Each poster can become a teaching focus for a student presentation to classmates or other professional forums in order to catalyse discussions of these wider dimensions. A description of the use of posters for these purposes with examples and comments by participants is included.

INTRODUCTION

The constant rapid development of technological innovations in health care necessitates creative teaching and learning strategies in the education of clinical nurses, particularly at the graduate level. Poster presentations as a useful and creative way to share knowledge among nurses are increasingly used at conferences particularly to present research findings (Beal, Lynch & Moore 1989; Bushy 1991; Kirkpatrick & Martin 1991; Lynne 1989). While also very appropriate for the display of conceptual issues, decision-trees and clinical knowledge in general, posters are particularly well suited to the presentation of new clinical equipment and techniques as described in this paper. Summers et al (1990) discuss the usefulness of posters as a strategy for describing clinical applications of computer technology. The popularity and applicability of posters to computer applications is well supported by the fact that 90 posters were presented at the 1991 Nursing Informatics Conference in Melbourne Australia. As an educational tool, posters are acknowledged to be a worthwhile strategy for both teaching, learning and assessment purposes (Kirkpatrick & Martin 1991; Duchin & Sherwood 1990; Sorenson & Boland 1991; Summers et al 1990; Rees 1990).

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THE TRADITIONAL USE OF POSTERS AT CONFERENCES

Conference posters are usually displayed at the conference venue for the duration of the conference and the presenters make themselves available for periods throughout the day to discuss the material with interested viewers. The presentation of posters at conferences has many acknowledged benefits such as; the sharing of knowledge and the easing into a professional presentation through what is considered a less stressful or daunting task than pesenting a paper (Thompkins 1989; Lynn 1988). Although less people see the poster than may hear a conference paper in plenary sessions there is the advantage of meeting and sharing ideas on the topic with interested colleagues at a more personal level. Networking opportunities and potential collaboration on research or clinical activities are increased. Personal and professional growth and an increased public profile (Mottet & Jones 1988) are potential benefits of poster presentation. Posters are valuable professional contributions and merit inclusion on a nurse's curriculum vitae.

The opportunity for valuable interaction between professionals in relation to the poster can also be created in the academic environment when it is used as an educational strategy. For example, opportunities can be created within the academic timetable for other graduate students and faculty members to view the posters while the presenter is available to discuss the material. In addition evaluative feedback can be presented by both academics and students. Evaluation by other graduate students is particularly useful for student learning (Beal et al 1989).

To weigh against these professional and educational advantages is the fact that quality preparation can be both time consuming and expensive, particularly if photographs and graphic materials are used. However, posters can be re-used as a display in the work environment or used as a teaching aid. This continued use contributes to the overall cost effectiveness of the work.

The very important details of design, presentation, cost and use of colour are well documented elsewhere (Kirkpatrick & Martin 1991; Lippman & Ponton 1989; Duchin & Sherwood 1990; Rempusheski 1990; Thompkins 1989). Attention to the physical demands of size, weight, display and mounting facilities is important. Consideration of size and weight is particularly important if the presenter is travelling by air. A clear understanding of the technical requirements is fundamental to optimal presentation.

EDUCATIONAL DEMANDS OF THE TECHNOLOGICAL ENVIRONMENT

In the current climate of explosive technological development in the health care system, posters may be used more specifically and very effectively to target adult learning needs related to technological nursing practice at the graduate level. New technological developments, device evaluation or its utilisation can be presented in a highly visual and informative way by the clinicians who use technological equipment. Graduate students may be required through their poster to address some of the more complex questions fundamental to technological assessment such as; cost effectiveness, research foundations and (among others) the potential for obsolescence. An additional benefit is that students can choose the new technology which they wish to explore, a strategy which is particularly appropriate for the adult learner. In addition, other students learn about a variety of technologies.

There is no doubt that technology is increasing rapidly within the health care system and that this has implications both for nursing practice and nursing education. McConnell (1989) notes that between 5–10% of devices in clinical practice were introduced in the last year. It is increasingly difficult for nurses to keep up to date with innovations (Abbey et al 1988). One of the key goals of graduate nursing courses is to produce a practitioner who is able to effectively develop skills of life-long-learning and adapt to change in a climate of information and technology explosion. It has been suggested that

technology can be viewed as detrimental to nursing in that it serves to increase the dichotomy which exists between education and service. It further creates a dichotomy within educational circles and within service areas (Yates 1983). If something is not done about the widening of the gap between education and technical equipment, technological ignorance will result (Thomas 1990).

Few would deny that it is imperative that nurses be proficient, informed and knowledgeable in relation to the clinical technology that they use in patient care. The implications for safe and effective practice are evident and the potential for care to be humanistic and patient centred is increased if the nurse is confident in the complex environment. This proficiency has always been the key foundation of the post-basic hospital courses founded in the rational technical model (Powell 1989). The need for more substantial education in the principles and uses of medical devices and for understanding and knowledge in relation to the purposes, capabilities and limitations of devices is well documented (McConnell 1990; Campbell et al 1988; Golonka 1986). McConnell (1989) writes extensively about the need to learn about devices and the multi-faceted challenge this places on nursing education. In terms of the use of technological devices, McConnell considers both the responsibilities and difficulties in relation to undergraduate education, postgraduate education, orientation, inservice and continuing education. Without optimal input from all educational sectors nurses will not be able to keep up with the knowledge demand created by the rapidity of technological development.

AN EVOLVING EDUCATIONAL CLIMATE

In New South Wales, Australia, there is a trend to move hospital based post-registration courses from the hospital environment into the university system. This follows the 1985 transition of pre-registration nursing programs from hospitals to colleges and universities, firstly as diploma courses and now as a bachelor degree. Currently there are several graduate diploma, master and doctoral programs offered.

Undoubtedly, posters as educational tools are used by those in both the university and the hospital based sector in a variety of ways. As the trend to move the more clinically based courses to the university sector continues innovative strategies such as concurrent employment, joint appointments, collaborative funding and teaching arrangements are being developed between some universities and health services. In a changing educational climate such as this, creativity is needed and it would be worthwhile to re-evaluate and refine teaching strategies. In this context posters which have not yet achieved a long history as an established tool in nursing education merit consideration.

If optimally used as an educational tool, posters have the potential to encourage the presentation of aspects of clinical technology in a way that bridges the need for both a practical, pragmatic explanation of its use and methodology as well as the broader issues associated with each as a technological feature of clinical practice. Such a duel focus is suggested in recognition of the belief that the technical rational approach which characterised hospital based programs (Powell 1989) may no longer be sufficient in terms of developing a global understanding of technology which will assist in both the management of and adaptation to change. The need to both evaluate the efficiency and effectiveness of technology in health care is acknowledged, as is the need to assess the broader social implications of its use such as; the potential for depersonalisation of care (Carnevali 1985; Fagerhaugh et al 1980; Arkosar 1987) and (amongst others) the de-skilling of staff (Brewer 1990). In-depth examination of the design and its related functionality may assist nurses to move towards collaboration in equipment design (Golonka 1986; McConnell 1989; Campbell et al 1988).

STUDENTS TARGET TECHNOLOGY IN THEIR PRACTICE

Within the Graduate Diploma of Medical Surgical Nursing course a compulsory subject entitled

Advanced Technology in Patient Care is offered. Students on this course are registered nurses from a range of medical-surgical practice environments such as; renal, neurosurgical, cardiothoracic, accident and emergency, critical care and burns and plastics. The aim of the subject is to increase the student's understanding of the impact of technology, within the health care system, upon both patients and nursing practice. It aims to increase both the theoretical knowledge base and the ability to use selected diagnostic and therapeutic technologies. The course does not have clinical subjects and the students need not be working in the clinical area. It is a generic, theoretical course with opportunities incorporated to allow the students to explore in-depth, areas of interest in their chosen specialty area.

This subject was seen as an ideal forum for the use of a poster as a teaching, learning and assessment strategy for a total of 34 students over 2 years. Two inter-related assignments were planned: a poster and a paper on different dimensions of the same technology. The paper provides in-depth exploration of the topic. This increases the amount of material that the student must tailor to the specific content needs of the poster (Table 1). Students were encouraged to present (in the poster) only a brief section on the 'application' and 'method of use' of the technology since this is the pragmatic 'hands-on' section which seems to become the focus of the work. The broader conceptual aspects such as potential for overuse, ethical considerations or timeframe for introduction of the technology receive less attention. The research substantiation of the technology's use in clinical practice was considered an important aspect which is often difficult to achieve and unfortunately, on occasion most of the research detail has only been available through the manufacturers. Understandably this is not considered an unbiased source, however the very discovery that little supporting research is available is useful learning.

Prior to preparing their poster and paper the students had a number of lectures and tutorials on technology in health care including topics related to the need for evaluation including topics related to the need for evaluation and assessment, costs, technology transfer, forces for introduction and other aspects. The definition of technology in its broadest sense is explored and the focus is then narrowed to 'clinical hardware' in the student's area of practice. The technology selected should be relatively new and have a significant nursing involvement.

An information session on posters complimented with slides of other posters was given early in the semester. However, feedback has indicated that this has proved insufficient. References on poster presentations were provided with an increased number offered in the second year as both groups initially seemed to find the idea of a poster quite daunting.

Examples of the technologies presented by the

Table 1

Technology poster dimensions for consideration
Essential
A description of the item/procedure including comments on design, ease of use.
Indications for use/application including potential for overuse/extended use.
Implications/special considerations for the patient and family if appropriate and the nurse.
Efficiency/effectiveness.
Ethical/legal considerations.
Cost implications.
Research support/not supporting the selected procedure.
Additional options
The impetus or source of development for the selected technology.
Time frame for introduction.
Control mechanisms placed on its use.
Potential for obsolescence/being out of date.
Other aspects found applicable.

Table 2

Examples of student poster topics	
Pulse oximetry	Ilizarov technique
Intraosseus infusions	Laryngeal mask airway
Cochlear implants	Volumatic inhalers
Air cast splints	Patient controlled analgesia
Autotransfusion	Transcutaneous cardiac pacing
Intrasite and kaldastat	Cardiac output monitoring

students are listed in Table 2. Students have had opportunities to display their posters to large groups of graduate students from a variety of backgrounds including senior management. It was hoped that some of the managers would negotiate with the students and take advantage of the opportunity to display the posters in their own institutions in some way. This did not happen although some of the posters were displayed in the student's own hospitals.

Alternatively, time in-class was allocated for students to present the poster to their own diverse student group. Public display in the university was retained and both undergraduates and graduate students displayed considerable interest in the works.

STUDENT FEEDBACK – MERITS AND PITFALLS

Students were given the opportunity to comment on the poster assignment independently of the usual subject evaluation process. The responses from both groups who undertook the experience were very similar and strongly positive. The use of this as an assessment strategy was highly supported with only one firm 'no'. A selection of common comments is listed in Table 3. Three respondents indicated that the exercise was stressful, daunting or time consuming.

According to their estimations, students spent an average of 25 hours on the assignment within a range of 10–92 hours. Estimated costs were on average $40 with a range from no cost to $85. One of the difficulties is that students vary in their opportunities to use computer, photographic and printing resources in their work institution or through other contacts such as spouses and friends. While this is not unlike variable access to resources in other assignments it seems more evident in such highly visible presentations, but should not be seen as a basis of inequity. A few developed their first computer skills in graphics solely as a result of the poster requirements. Limited access to university administrative staff as technical resources and to a colour printer was offered but little utilised.

Considering that posters are meant to be a useful resource for repeated use and offer the student opportunity for professional development it is important to consider their usage beyond the classroom. At the time of the student feedback, only two had been put on public display outside the university. Two others were used in developing ward protocols and for teaching purposes. However, already some of the 1992 posters have been utilised for teaching purposes, displayed in wards, attracted manufacturers' interest, shown at a national conference and scheduled for presentation at a professional meeting. A number are scheduled for presentation at a 2 day Patient Care Technology Conference this year.

STUDENT FEEDBACK OFFERS GUIDANCE FOR THE FUTURE

In terms of preparation of the poster, student feedback responses were quite balanced in terms of the hardest and the easiest aspects. With a few exceptions the display and presentation of the poster to the immediate class was both easy and a useful learning experience in itself. A negative

Table 3

Student comments
Appreciated creating a resource, teaching tool.
Good variety, change from essays and literature reviews.
Allowed focus on area of personal interest.
Appreciated freedom of choice.
Opportunity for creativity.
Puts us on a professional level.
Forced clarity.
Stimulated artistic streak.

aspect was, as expected, the fact that research into the topic took considerable time. The other 'hardest' aspects listed most frequently were determining exactly what was needed, planning, condensing and laying out the material as well as the technical uncertainties of preparing materials, photographs, graphics and artwork and lamination. The latter difficulties were not surprising as this was a new area to these students.

Although the requirements were printed in the subject outline, students had difficulty determining what to distil onto the poster so that it was a stand-alone, self-explanatory piece of work. Two posters did not achieve this. As students were also presenting their poster to the class they may not have realised the importance of it as a complete work in itself.

The students' inexperience in poster preparation meant that clear, definitive instructions were needed. Many had never seen or heard of conference posters. Although 15 slides of students' posters were shown in the explanatory session of 45 min many did not absorb this information adequately. As there are no absolute specifications for posters, broad guidelines on size and materials were given to allow students more freedom but this proved stressful for some. Sample posters may have been of benefit.

In conclusion, posters are a valuable learning and assessment strategy for exploration of the multiplicity of complex issues related to the introduction and use of new technological devices and procedures that are entering the health care arena. With increased exposure to such a method of presentation students should find the development process itself less stressful which may then make the learning experience itself more effective.

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