Computer workshops of various descriptions are proliferating at a rapid pace to meet the growing need of professionals to become "computer literate." These workshops range from one hour seminars for the general public at computer stores to institutions for specific professional groups such as nurses, business managers, teachers, and faculty development programs at Universities. Educators within specific professions such as nursing are frequently unclear on their options for computer literacy education (Hardin & Skiba, 1982; Skiba & Hardin, 1983). Increasingly however, educators also wish to respond to learners interests to implement some form of computer related educational workshop. This paper is targeted to nurse educators with interests in implementing computer literacy workshops. In this paper we will analyze our workshop implementation experiences as well as review the literature from several professions in the area of "workshops" for computer literacy. This discussion will be framed within the context of a micro-based computer workshop series designed by the authors. Our workshop series for nurses has been designed to teach nurses about computer technology with specific applications in nursing, and to provide for interactive ("hands on") experience for learners.

Introduction

Computer literacy education, although only a roughly defined field has become an important area of concern in all levels of education (Seidel, 1982; Masat, 1981). For the last 10 years educators have grappled with curricula for computer literacy. In contrast to education, the concept of computer literacy has not received much attention in business and industrial training (Kearsley, et al. 1982). Recently it has become apparent that there is a national need to foster computer literacy (Molner, 1979). To meet this growing need, various educational strategies are being implemented as solutions. These solutions include: one hour training sessions at computer stores, adult education programs, computer-training or continuing education workshops for various professions and faculty development institutes.

Computer training workshops, according to Rothfeder (1983), are one of the fastest growing businesses in the country. The education of nurses about computers has been the primary responsibility of staff development or staff orientation programs in health care institutions (Carlsen, 1982; Hardin & Skiba, 1982). Several years ago, relatively few courses or continuing education offerings were even proposed. While health care institutions have spent a large amount of money and time educating their staff about a particular computer system or application, little has been done to provide health care professionals, especially nurses with a general understanding of the computer and its use (i.e. to promote computer literacy per se). As in other areas, nursing has begun to respond to this growing demand to become computer literate. The authors (Hardin & Skiba, 1982) reviewed the concept of "computer literacy" and analyzed existing educational models for promoting computer literacy. Computer literacy can be defined as a general understanding of how the computer works, how computers can be productively used and their relative advantages and disadvantages. The analysis indicated that no single educational model is likely to be effective in the "delivery" of computer literacy for various levels of computer skill acquisition and various types of nurses.

As a continuation of our work in this area, the authors have developed two approaches to educate nurses about computers. The first approach is a four credit elective offered to both baccalaureate and graduate students in Boston University School of Nursing. The second is a continuing education workshop series entitled "Nurses and Computers." The workshop series is our focus in this paper.

Workshop Version 1

In a previous paper the authors described an awareness level workshop designed to "provide a solid conceptual base for understanding computer operations didactically, as well as a positive experiential base through interactive computing" (Hardin & Skiba, 1982). Despite highly positive evaluations, two problems were noted, "where-from-here" issues for students, hardware (terminal) access and logistics.

We felt particularly motivated to improve the quality and quantity of the "hands-on" portion of the workshop. Participants clearly identified "hands-on" work as the most valued portion of their learning experience, and the most frustrating. Learners frustration centered on the fact that logistical considerations limited their actual time spent "on" the computer to a total of about 40 minutes during the one-day workshop. The workshop design constraint which limited interactive computer time was the availability of only four computer terminals. This meant that despite
steadfastly limiting enrollments to 18 (2 sets of partners at a time through the interactive exercises), and devoting the entire afternoon portion of our workshop to "hands-on" exercises (difficulty of terminal access and severe limitations on interactive exercise, scope, and content), we made the decision to explore options in developing a microcomputer-based "hands-on" workshop series.

Suggested Workshop Strategies from the Literature

Prior to designing our microcomputer workshop series we reviewed available sources to gain from the collective experiences of other computer educators. Several major points were noted in this review.

1) Little documentation existed in regards to staff orientation to computerized systems (Charters, 1981; Holloran, 1982; Zielstorff, 1982) or educational offerings about computers especially with "hands-on" interactive experience (Newbern, 1982; Walker, 1981). As Edmunds (1982) noted there is minimal difficulty in outlining didactic portions of systems orientation but it is more difficulty (and time consuming) to design the interactive component.

2) Several educational strategies for staff orientation or computer literacy educational offerings were suggested. Predominant orientation models were: training trainers (Guttman and Doyle, 1981; Podemski, 1981; Zielstorff, 1982), self-paced programs (Carlson, 1982; Edmunds, 1982; McNeely, 1981), or multi-tier training (Cumber, 1981). In continuing education or inservice offerings, there were two predominant models: liaison-consultant model (Butler, 1982) or the "lecture-demonstration-hands-on" teaching cycle model (Kearsley, et al. 1982).

3) One central theme inherent in both staff orientation programs or educational offerings was that teaching methods need to simulate concrete professional situations in order to be effective (Cruetz, 1982; Holloran, 1982; Kearsley et al. 1982; Kent, 1982). Applications must illustrate concepts and practices in the learners' professional practice. As Clark's (1976) study suggested inclusion of subject matter relevant to learner's professional needs influenced improvement in the retention of and attitudes toward computer learning. Therefore, applications directly relevant to a learners' job was considered an essential component of successful workshop offerings in computer literacy.

4) Direct involvement of "hands-on" interactive experience was identified consistently in the literature (Cruetz, 1982; Charters, 1981; Cruetz, 1982; Cumber, 1981; Holloran, 1982; Kaplan, 1981; Kearsley et al. 1982; Newbern, 1982; Zielstorff, 1982). According to Kaplan (1981), this hands-on interactive experience allows learners to overcome their fears about computers; gives learners a concrete sense of what a computer is and demonstrates that a computer can be controlled and used as a tool.

5) Another vital ingredient of offerings was the time element (Carlson, 1982; Cruetz, 1982; Cumber, 1981; Holloran, 1982; Newbern, 1982; Zielstorff, 1982). Although there was no minimum amount of time suggested, it was agreed by researchers that sufficient time should be allowed for participants to become "comfortable" with the computer as a machine and allow for needed repetitions to insure learning of key skills.

6) Although sufficient time and hands-on experience were viewed as essential components, several authors suggested that learning about computers should not require extensive education (Charters, 1981; Newbern, 1982). As Wolitzer (1977) pointed out, the notion of learning a new discipline was one of the reasons why many faculty members resisted learning about computers.

7) Since many people resist computers because of their fear of losing their job (Wolitzer, 1977), staff orientation and educational offerings should be presented in a non-threatening manner and the notion of a computer as a tool should be emphasized throughout the program (Charters, 1981; Kearsley et al. 1982; Ragsdale, 1982).

8) The recent trend in microcomputers usage, especially in hospitals (Bohrenfest, 1982), suggests that educational offerings be micro-based and use readily available generic software which can be tailored to meet the users' needs (Charters, 1981; Kearsley et al. 1982).

Nurses and Computers Workshop Series

Based on our experiences with the version 1 workshop, and the literature review, the authors designed a two-part workshop series. The first workshop is an introduction to computers and provides a foundation for "computer literacy skills." These skills are expanded in the second workshop which emphasize interactive experience using a microcomputer.

Nurses and Computers

This workshop provides an introduction to computers and computer technology. The workshop is targeted for learners who have had minimal or no exposure to computers. The didactic material covered is as follows: what is a computer, how a computer works, common terminology, algorithms, flowcharting and the various uses of computers in nursing education, research, administration, and practice. Small group exercises allow the participants to learn how to automate a registration
form, as an example of elementary data management techniques.

**WORKSHOP OBJECTIVES:**

The participants in the workshop will be able to:
- define the concept of computer literacy;
- identify resources in nursing to promote computer literacy;
- develop a basic understanding of how the computer works;
- develop an elementary knowledge of computer terminology;
- develop an understanding of the information processing power of the computer;
- identify uses of the computer in the health care setting; and
- identify resources concerning computer applications in health and nursing.

**Microcomputers in Nursing**

This workshop provides an opportunity for learners to interact directly with a microcomputer. The hands-on exercises are based on widely available, easy to use software packages with real world applications. Participants team up with one colleague on their own microcomputer system. Participants have the opportunity to develop an understanding of microcomputer operations and available software which can be used to facilitate professional practice and administrative problem solving.

Topics covered in the workshop include a general introduction to microcomputer use with a BASIC program demonstration, a demonstration and exercise using a data base management software package (2 hours of hands-on work), and a demonstration and example of using an "electronic spreadsheet" package (2 hours of hands-on work).

**WORKSHOP OBJECTIVES:**

The participants will be able to:
- develop an understanding of microcomputer terminology including hardware and software components and capacities of microcomputers in nursing;
- develop a working knowledge of two prominent software packages through hands-on exposure and practice; and
- evaluate the capacities of microcomputers for professional practice and administration.

**Implementation Issues**

Designing the revised workshop series has been a learning experience for the authors, the process has taken approximately six months to resolve the resource (time, money) issues involved. The most crucial issues we faced in getting the workshop series "off the ground" are discussed below. We will be reporting the results of the workshop offerings in subsequent publications.

**Hardware Access**

Obtaining access to an appropriate amount of microcomputer hardware (1 microcomputer for 2 people) was the critical and the most costly implementation issue. The equipment was not available in the University nor was it feasible for the School of Nursing to purchase the equipment.

Equipment rental was explored but was not feasible since most computer stores would not rent equipment on a daily basis (they tend to require a one year rental contract). With these difficulties we felt very fortunate to develop a collaborative relationship with a community-based micro-computer educational facility this past winter. Arrangements have been made to lease their facilities which include 12 microcomputers, multiple copies of necessary software packages, a "Daisy chain" communication network, and a special instructor controlled monitor.

**Software Development**

As we discussed previously, at the present time there is little "nursing software" readily available to use as a basis for computer education. This situation presents two alternatives, either hiring a programmer to code application examples or to adapt generic software packages for use with nursing application problems. Time and expense considerations preclude the first alternative. Further, the number of copies of generic packages available from our hardware facility insured that "adapted" applications could be offered as learning modules for workshop participants. In order for the workshop to be an effective educational experience the adaptations of the generic software must demonstrate clearly to learners its value as a tool for solving real world problems.

**Summary**

In concluding, we note that the mechanisms which have allowed us to develop demonstration software include our hardware facilities stock of generic packages for use in the workshop, the ease of "programming" these packages provide, and the fact that between the collaborating organizations we have strong hardware and software computer expertise, an understanding of real world nursing application areas, and educational expertise.

**References**


