DOCUMENT RESUME

ED 222 180 IR 010 413

AUTHOR Mikan, Kathleen
TITLE Learning Resources Center Conference: Proceedings and Evaluation.
INSTITUTION National Library of Medicine, Bethesda, MD. National Medical Audiovisual Center.
SPONS AGENCY National Medical Audiovisual Center of the National Library of Medicine, Atlanta, Ga.
PUB DATE 80
NOTE 139p.; The proceedings of the Learning Resources Centers (LRC) Conference hosted by the University of Alabama School of Nursing (Birmingham, AL, December 1978).

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Audiovisual Instruction; *Educational Facilities Planning; *Educational Media; Facility Case Studies; *Facility Utilization Research; Higher Education; *Learning Resources Centers; *Nursing Education; Questionnaires; Surveys
IDENTIFIERS *Nursing Schools

ABSTRACT

This report includes both a collection of 16 papers presented at a national conference on learning resource centers (LRC's) in nursing schools and the results of a survey of participants conducted to evaluate the impact of the conference. Designed to increase the participants' knowledge and awareness of how they might better utilize an LRC to support their nursing education programs, the conference focused on management of LRC's. Topics covered by speakers include the past, present, and future of LRC's; organization components and structural models; creating functional LRC's; getting faculty involved with two case studies; facility planning and design; integrating the LRC with school curriculum; management and operations; evaluation of cost and learning effectiveness; and performance testing in a learning skills lab. Three papers summarize research studies: (1) a survey of innovative programs; (2) an analysis of LRC's as a function of the director's academic qualifications and the center's administrative, fiscal, and organizational structure; and (3) a classification scheme of questions asked by nursing students in self-instructional learning environments. The report also details the findings of a survey of conference attendees, which evaluates both short- and long-term conference impact and describes characteristics of participants and their LRC's. Appendices include the questionnaires used and a summary of conference participants by geographic area. (LMM)

LEARNING RESOURCES CENTER CONFERENCE:

Proceedings and Evaluation

Kathleen Mikan, R.N., Ph.D.
Director of Learning Resources Center
University of Alabama School of Nursing
University of Alabama in Birmingham

This monograph was developed as a service to the health sciences academic community, under agreement between the author and the National Medical Audiovisual Center, National Library of Medicine.

1980

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE
National Medical Audiovisual Center

Bethesda, Maryland 20209

TABLE OF CONTENTS

PREFACE

In December 1978, a national conference on Learning Resources Centers (LRC's) in schools of nursing was held in Birmingham, Alabama. The conference was the first of its kind and was attended by over 145 people from all over the United States. Two people attended from Canada; thus, the Conference was international in scope. The conference was hosted by the University of Alabama School of Nursing at the University of Alabama in Birmingham.

The conference was oriented towards the management of LRC's and was designed for administrators, faculty, and LRC personnel from all schools of nursing--diploma, associate degree, and baccalaureate--which had or were planning to have a Learning Resources Center.

The LRC Conference was both needed and timely. Every school of nursing has, in essence, the beginnings of a Learning Resources Center when one considers the books, audiovisual materials, and nursing equipment that already exist within the school. However, school of nursing administrators, faculty, and LRC personnel need help in organizing and fully integrating these resources into the nursing curriculum. In the past, many school of nursing administrators have applied for and received Federal or State money to buy AV equipment and/or AV materials to support student learning. However, much of the equipment and many of the materials purchased have been underutilized because of a lack of understanding about how to use them effectively to enhance instruction. The conference was designed to increase the participants' awareness and knowledge of how they might better utilize an LRC to support their nursing education programs. This was the rationale for conducting the conference.

The purpose of this monograph is to present the proceedings of the LRC Conference and the evaluation data that were collected during and following the conference.

Grateful appreciation is extended to the large number of persons who assisted in the planning, conducting, and evaluation of the LRC Conference and in the preparation of this monograph.

The author is deeply indebted to conference speakers who contributed the papers for this monograph and to the LRC Conference participants who cooperated in the completion of the evaluation instruments. Without these individuals' contributions and cooperation, the conference could not have been the success it was nor would the data from the conference have been reportable.

Special appreciation goes to Fred Horns, III, for his support and assistance in helping to make the conference successful and for attending to many aspects of preparing this monograph.

A special thanks goes to Nancy Conn and Mike Quarles for their extra special contributions to the conference and its evaluation and to the other LRC personnel, Pearl Chopra and Sheila Russell, for their assistance and hospitality at the conference.

Recognition and thanks are also given to two doctoral nursing students, Phyllis G. Nichols and Ellen Patterson, who served as research assistants in the preparation of the evaluation section of this monograph.

Special appreciation also goes to the Dean of the University of Alabama School of Nursing, Dr. Marie O'Koren, who supported the idea of the LRC Conference, for her encouragement throughout the planning, conducting, and evaluation of the conference.

Special recognition is given to Jean McFadden at NMAC who served as project officer for the monograph and to the National Library of Medicine who helped pay for the monograph.

Recognition is also given to the fine secretarial support services of Gail DeLoach, Dorothy Ainsworth, Anne Phelps, and Brenda Gosnell. Appreciation is also expressed to the faculty and graduate students who helped at the conference and to Phyllis Loucks for her continuing education support services.

Appreciation is also expressed to all the individuals who typed the LRC Conference correspondence and proceedings and who edited and proofread the manuscript. Without all of these individuals' assistance the conference and the monograph would not have been possible.

LEARNING RESOURCES CENTERS--PAST, PRESENT, AND FUTURE

Virginia W. McPheeters*
National Medical Audiovisual Center, Atlanta, Georgia

The need to impart knowledge to future generations is as old as the human race. Man in his most primitive state developed skills and acquired knowledge that he passed along to his children to ensure their survival. It was common practice for one individual, who became well versed in the history and customs of the group, to be accepted as the principal source of knowledge.

Such practices have continued throughout history, and in every age we have the familiar figure of the scribe, prophet, or teacher sharing his wisdom with eager students. However, the individual as the principal medium for passing on knowledge had an extremely limited outreach. Regardless of his excellence, only a fortunate few were able to benefit.

Nevertheless, for hundreds of years the dissemination of knowledge was dependent on individuals and a limited number of handwritten books. For example, in the early years, medical knowledge was transmitted almost entirely through the apprentice system. The student looked to the master for his knowledge. Innovative students added to this knowledge and passed it along in turn to others.

In the 15th century, Gutenberg's invention of the printing press with moveable type opened a new avenue for the more rapid spread of knowledge. Since then the book has been, and for the next few decades will probably continue to be, the most widely used means of disseminating knowledge. The medium of the printed word enabled the individual purveyor of knowledge to reach an audience far beyond the sound of his voice. The post-World War II popularization of paperbacks revolutionized education by making the book an inexpensive medium. More recently, the computer with its wide range of capabilities holds promise of further revolutionizing the field of education.

For hundreds of years, education progressed in a fairly unstructured manner. But eventually the organized school evolved as a center for learning. The principle is the same whether the school comprises a small group gathered under a tree, or hundreds of students in an elaborate building. The organized school has now become the accepted center for learning, and the simple educational tools of papyrus and stylus have evolved into the multimedia in use today.

The proliferation of books led to the establishment of libraries as central areas for housing, cataloging, and circulating them. For books to be useful as a learning resource, they must be readily available to the student. Today nearly every school has a highly efficient library system. The present day learning resources center is a direct descendant of the library.

A phenomenon of this century has been the rapid increase in the development and use of learning media. During the Second World War, films, filmstrips, and recordings proved invaluable in training civilian and military personnel. This provided the impetus for extending media use into the mainstream of education. Following the war, development of the opaque and overhead projectors, refinements of film projectors, and the advent of television provided additional equipment.

In the 1950's, the use of television for education expanded rapidly. More recently, programmed instruction and electronic-based information retrieval and data processing systems have provided new tools for the educator.

*Presented by Susan M. Sparks, R.N., Ph.D., Chief, Instructional Materials Design and Development Section, National Medical Audiovisual Center.

The current expansion of media use in education is directed at increasing the efficiency and effectiveness of learning. But, as in the case of books, such materials must be readily available to the user to be effective.

Optimal utilization of learning media necessitated the development of new design concepts for educational facilities. The rapid proliferation of software in many subject areas presented a growing need to provide an easily accessible central storage and retrieval area for learning resources: books, slides, charts, models, film clips, tapes, and media of all kinds. As media became an increasingly accepted means of providing additional opportunities for learning, it was evident that such materials must be made easy for the student to locate and easy to use.

The already existing library often became the early repository for media, both hardware and software. But many librarians, geared to the neat, compatible book format, were bewildered by the variety of packaging of the audio-visual materials. Many times the hardware wound up in a closet with no one around who knew how to use it; or the software was not cataloged in any manner so the student could locate it. Recognition of such problems inherent in the use of media came slowly.

Isolated instances of individual staff members providing effective use of media have increased. But only when administrators and staff develop a cooperative attitude toward planning for the use of media can maximum effectiveness be achieved.

A slide set on a table in any empty classroom was, perhaps, the forerunner of the now sophisticated study carrel. The first principle that appropriate material be readily available was at least met. As the number and variety of available media increased, along with pressure to meet the needs of a growing number of students, these first meager facilities expanded. Often the interested teacher who became most knowledgeable about media and equipment found himself or herself as unofficial advisor to others and custodian of such materials.

A slow process of evolution through many stages of trial and error has resulted in the modern learning resources center. The need for specialized training in the handling of media was evident from the beginning, but this problem has yet to be fully solved. Although present learning resources centers vary widely in size, configuration, and sophistication, basic concepts apply to all. Essentially, such a facility is a designated area or areas where the individual student or groups of students come to learn through the use of media. The ideal center provides for three categories of activities: 1) media storage and retrieval (media may include everything from books and pamphlets to the most sophisticated computer-assisted programs or simulation models); 2) individual or group study; and 3) production of media to meet special needs. Any given learning resources center may not provide ideal service in all three categories, but most will contain some components of each. Generally, only limitations of adequate space, qualified personnel, and money prevent the development of the most effective center.

The present general awareness and acceptance of the value to the learning process of a well designed, adequately staffed, and efficiently operated learning resources center bodes well for the future. Such an operation fits well with the widespread drive today for economizing on resources used in learning--teachers' time, materials, and facilities. The use of media can often increase the effective, efficient utilization of these resources.

In today's world, learning is an ongoing activity, with schooling extending beyond basic skills into specialization and continuing education, as

well as retraining. Schools now must serve all groups--not only the average but also the gifted, the handicapped, and the educationally underprivileged.

The rapid expansion of knowledge has brought about a crisis in communication of such knowledge. The learning resources center provides a mechanism to disseminate this vast body of knowledge and is a key means of providing different learning situations to a wide variety of learners in a manner best suited to their particular needs. Designs for such centers are on the drawing boards for most new educational facilities. Educator, architect, and audiovisual specialist should cooperate in developing such plans and tailoring them to the particular needs and budgets of a given institution. New ways of communicating require new physical settings. Plans for these facilities should reflect the school's educational philosophy. Fortunately, there is a growing realization of the importance of proper planning, and it is hoped that future learning resources centers will greatly benefit from this.

Indications are that the role of media in education is an expanding one. More educators are becoming involved in the production and use of media. In industry, there is a concerted effort to develop hardware with compatible, interchangeable components to perform a variety of tasks. The learning resources center staff will be called upon for leadership in ensuring the effective utilization of these tools. More and more, the fragmented approach to media usage will evolve into an integrated approach, with books, television, films, and graphics all considered as having specific importance.

To meet the challenges of media use in education, three groups of specialists are evolving: those who plan and design learning situations to make the most effective use of media; those knowledgeable in the technology of supporting hardware, its operation, maintenance, and repair; and those skilled in television, film, and graphics production. The future will find more specialists and more equipment providing more kinds of learning situations through the use of media. To accommodate this trend, learning resources center staff will, of necessity, be expanded.

A variety of spaces also will be required, where students, teachers, and different media can be brought together in varying configurations. But always, educational goals and student needs must have priority in design of facilities.

Taking media to the student is often desirable. This may require certain lecture halls or classrooms with suitable equipment, lighting, and acoustics. Providing for multimedia learning situations requires special planning. Achieving flexibility in space and equipment without sacrificing optimum effectiveness of media usage will continue to challenge man's ingenuity. Shareability and scheduling of space and equipment among the different disciplines will be key aspects of this flexibility.

I have asked two leading nursing educators to share their perspectives on future trends in learning resources centers. First, Dr. Kathleen Mikan, Director of Learning Resources, School of Nursing, University of Alabama in Birmingham, Alabama.

"Although the specific role of learning resources centers in the future will vary greatly within, between, and among institutions, I do envision that the essential components of an LRC--a centralized facility that provides coordinated educational services and learning activities--will be present in a variety of institutions: hospitals, public health agencies, and clinics, as well as formal educational institutions. The LRC will exist wherever there is a need for organized educational services. Although the LRC will exist in all these different institutions, it will be most fully developed and utilized in the formal educational setting.

"As for LRC's in schools of nursing, I envision that they will become a vital component of the nursing education curriculum. I envision that the learning opportunities provided in and through the school's LRC will replace many of the learning activities currently being provided in today's classrooms.

"Users of the LRC will have a choice of how they want the information presented. They will be able to read it, see it, hear it, or have it read to them, depending upon the individual's preferred learning style. Within any given program, the student will be able to speed up or slow down the rate at which the information is presented, according to his individual rate of comprehension.

"The learning of attitudes and values through LRC learning activiites will be as important as the learning of skills in today's LRC's. The LRC in the future will have areas specifically designed for the learning of attitudes and values through the use of games, simulations, and group discussions.

"Evaluation will become a major function of the LRC of the future. Diagnostic, formative, and summative evaluations will be administered through the LRC. The results of these evaluations will be used to guide students through prescribed learning activities.

"Computers will help simplify paper work, grade tests, schedule learning experiences, monitor students' progress through various learning activities, and prescribe remedial, basic, or advanced learning experiences according to individual students' needs; but they will not take over the complete educational process. Computer-managed instruction will be likely, but not total computer-assisted instruction.

"I envision in the future that LRC's associated with schools of nursing will be tied into larger networks of information systems, as part of larger computer networks. Nursing faculty will also become active users of--and hence learners in--the school of nursing's LRC. National data banks that can be accessed through terminals located in the LRC will help faculty keep up to date on the latest research. Literature searches will be initiated by simply pushing a button.

"In summary, the LRC in the future will provide a wider variety of learning opportunities than it does today. The LRC will not be a substitute for clinical learning experiences either in the hospital or in the community. The LRC of the future will allow the school to accommodate to fluctuations in students' loads while simultaneously conserving human and nonhuman resources. The LRC of the future, if well designed, managed, and integrated with the curriculum, will be the heart of the nursing curriculum of the future."

Now, Dr. Crystal Lange will tell us about future trends she envisions. Dr. Lange is Director for the Division of Nursing and Allied Health Sciences, Saginaw Valley State College, University Center, Michigan.

"In my perspective, the learning resources center of the future will have increased and improved technology that will permit a number of extensions of learning activities both in learning centers and in learners' homes or extended environments.

"The interactive educational computer will permit graphic presentation or self-paced learning at home or at the learning resources center. This equipment will become increasingly miniaturized, increasing its portability, decreasing its cost. The learner will have variable speech control and, with a little practice, might well complete a learning unit in speeded-up time. I see increased use of simulation for initial practice, so that learners will not need to go to the actual clinical setting until they have gained beginning level skills in a simulated setting. Testing, both formative and summative,

will become increasingly available for the learner both in the learning resources center and at his home. I see the learner as having access to the computer, via an attachment to the home television screen, to present the visual component of any kind of interactive learning that might be required.

"Another dimension of the learning resources center will be its expanded utilization for continuing education both for graduates and for faculty, both in individualized format and in the small group format. I also see the learning resources center as having potential utilization for learning experiences designed for the patient or the client, which may be brought to the bedside during hospitalization, or to the client's home. Materials might deal with specific health problems, such as a myocardial infarction, or with specific health learning needs--perhaps things like nutrition, and exercise or activity programs.

"Along with this increased and improved technology, I see a need for increased individualized interactions between faculty and small groups or individuals. These interactions may well take place in the learning resources center, or by way of video-telephone or other visual contact. There will also be opportunities for students to interact with other students, both in the LRC and in extensions of that center into individual students' homes.

"I see increased overall technology, much of which we may not be able to conceive of at the moment, but which will extend the communication capabilities in audiovisuals and in hard format; improved knowledge with reference to learning styles and ideal or preferred learning formats that are in keeping with particular learning styles; and opportunities for increased human interactions to develop and improve the affective domain of learning activities. I think it's going to be an exciting and productive time."

The learning resources center of the future will be called upon increasingly to provide everything for everybody. Each institution will have varying space and personnel requirements to meet its educational philosophies and goals. But the principle of the learning resources center as a means of extending the educational resources of an institution to provide optimum learning experiences to the maximum number of students in a minimum time schedule remains constant. The expanding responsibilities of the future learning resources center may indeed serve as a catalyst for significant changes in the process of education which will markedly affect future generations.

Distribution of software to a nursing student at the University of Alabama in Birmingham.

LEARNING RESOURCE CENTERS: ORGANIZATIONAL COMPONENTS AND STRUCTURAL MODELS

Howard F. Langhoff, Ph.D.
Cobe Laboratories, Inc., Lakewood, Colorado

WHY A LEARNING RESOURCE CENTER

Since the late 1950's, the focus of education has been on the learner learning rather than the teacher teaching. The heart of education is student learning, and therefore the value of anything associated with education must be measured by its ability to facilitate learning. Whether the learner learns by himself, with fellow students, through a teacher, or through some other agent, "less teaching and more learning" must be the goal of enlightened educators.

For centuries, assumptions have been made about, and for decades research has been conducted on how learning takes place. But these assumptions haven't helped much in practice. The traditional mix of teacher, textbook, and blackboard has not been flexible enough to meet the learning needs of individuals. Thus, in recent years, a fundamental change in instruction has been proposed. This change advocates

> ...a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction (U.S. Congress. House. Committee on Education & Labor, 1970).

When this process is applied to the organization of an LRC, it means, first of all, that an LRC is organized according to a plan and secondly, that the plan is based on the systematic analysis of what is to be learned, who is to learn it, how it is to be learned, and how to determine when it has been learned. The process also includes the development of a learning environment to achieve the plan. Although far more complex models for planning an LRC can be found, these four steps--identifying what is to be learned, identifying who is to learn it, determining how one knows when it is learned, and developing learning environments--are basic to the systematic approach to instruction, including organizing an LRC.

Using this framework, then, the functions of a Learning Resources Center are:

1) To provide instructional materials identified as needed in the analysis of the learning and learner.

2) To provide for optimum utilization of the materials in learning environments as identified in the analysis phases.

3) To provide efficient and effective organization which makes the service real and not some self-serving empire.

COMPONENTS

When organizing an LRC, there are five components that need to be considered. They are equipment, software, people, services, and facilities. Each of these will be discussed in more detail.

Equipment

The equipment requirements for an LRC are influenced by the types of software that are available, the production needs and resources of the institution, decisions and purchases that have already been made, and the budget. All of these factors need to be taken into consideration when making LRC equipment purchase decisions.

Three principles should be kept in mind when equipping a Learning Resources Center. The first principle is flexibility. Flexibility is necessary to ensure as much utilization of the equipment as possible. For example, very few local production centers prepare filmstrips, but they almost all produce slides. Thus, a 2 x 2 slide projector can be used for both commercially available and locally produced materials, whereas a filmstrip projector would probably be used only for commercially available materials.

There is available on the market a variety of independent study equipment from which to select. Some of this equipment, particularly some of the 16mm and 8mm motion picture equipment, can be used with only a single supplier's software. Thus, it is wise, and also advantageous, to purchase equipment which will accommodate a broad range of materials rather than being limited to the offerings of a single supplier.

The second principle is compatibility. An obvious example of the need to pay attention to compatibility is in the selection of video tape equipment. When the first generation of half-inch video tape equipment became available for purchase, it was distributed by only a few manufacturers. However, initially, one could not play a video tape produced by one manufacturer on any other manufacturer's video tape player because of incompatibility. Another example of incompatibility is in the synchronized tape/slide equipment. Until the industry agreed not too many years ago to use standard tones to advance slides, one was not always sure if the advance tones on commercially distributed audio tapes would automatically advance slides on one's own equipment. Even today there is a 50 Hertz system and a 1000 Hertz system of tones used to advance slides or filmstrips. However, the 1000 Hertz is the industry's standard.

The third principle is standardization. Standards should be established for purchasing equipment at each institution in order to simplify maintenance and operation requirements. The greater the similarity between pieces of equipment, the less threatening a new piece of equipment will appear to a faculty person. Standardizing on one manufacturer's equipment within each format will simplify and streamline equipment maintenance and repair as well as reduce the need for a large inventory of repair parts. Within an institution there should also be agreement as to what choices of media formats will be available. The most popular media formats are: print and still pictures for handouts; audio cassette for sound; 2 x 2 slides for visuals not requiring motion; and 3/4" video cassette for media requiring motion. Although 1/2" video cartridge offers many advantages, including a 25 to 40% cost difference for Learning Resources Centers, it is just beginning to become popular.

Equipment will be needed in the LRC to support both media utilization and media production. In addition, equipment may be needed for media use in the

classrooms, in the skills laboratories, for independent study, and, if permitted, for off-campus uses such as home visits. If the student is to study independently, then study carrels, small screen projectors, audio cassette players, video cassette players, skills practice centers, simulated environments, models, and demonstration equipment will be needed.

Software

The software that will be available in the LRC can be selected from a variety of sources. Many software systems are available commercially. Since these materials were produced for the purpose of making a profit, they are designed to meet the needs of the broadest possible audience and, therefore, may not meet specific needs of the learners at a particular school. Often these commercial materials can be modified within the limits of the copyright law to fit the learning needs of a particular audience. The cost of purchasing commercial materials and then modifying them (where legally possible) for local use is minimal. Assuming that there are commercial materials available that meet these requirements, then these materials are the preferred and most economical approach to obtaining software for the LRC.

Another way to provide software for the LRC is to use a combination of commercially available materials and locally produced materials. Although this approach is more expensive than the first choice, a good mix is usually needed between materials obtained commercially and those produced locally. With excellent resources available commercially, an LRC should not be obligated to produce all of its own learning materials.

The third and last choice would be for a school to produce all of its own materials. This is the most expensive choice and, for that reason, should be considered the least desirable alternative. In some instances, however, this alternative is the preferred choice because existing local production facilities, equipment, and staffs must be justified.

People

The third and most important component of an LRC is people. The kinds of people needed in an LRC are a manager, content experts (who serve as consultants), instructional developers, producers such as artists and photographers, clerical help, librarians, and AV technicians. All of these people are needed whether they are located within the school or are a part of the all-campus audiovisual services. The attitudes of these people are what will make or break a Learning Resources Center. The people must be easy to get along with, service oriented, flexible, and professional.

Services

Services are the fourth component of a Learning Resources Center. All too often the primary reason why an institution of higher education exists--the preparation of students to enter the world as competent practitioners--is lost amidst the day-to-day shuffle of work. If it weren't for students, higher education wouldn't exist. Students, and service to them, are often the last things considered in organizing a Learning Resources Center. Unfortunately many centers are struggling to maintain their usefulness now because they served the wrong groups formerly. Regardless of facilities, equipment, software, and the decisions made, if a Learning Resources Center has given attention to the people it hires and the services it provides, it will survive nine times out of ten.

The services of a Learning Resources Center vary from situation to situation but can include: 1) instructional development; 2) local production;

3) AV operations; and 4) other instructional support functions, i.e., audiovisual material distribution.

Instructional development is the application of the systematic approach mentioned earlier. Specifically, it involves the analysis of learning, the analysis of learners, the establishment of standards to measure learning, and the development of the learning environment. Application of this process includes assisting the content specialist (usually the faculty member) in analyzing the learning and learners, setting objectives, writing evaluations, and specifying resources and environments in which the learning is to take place. The task of identifying whether or not there is any software already available which could possibly meet the specifications of the unit of instruction being considered for development should be assigned to a knowledgeable person. If no materials are available, or if what is available is not suitable, then local production will be necessary.

Another service of the LRC is local production. Local production can range from simple line drawings and photography to complex medical illustration and scientific cinematography. There are five facets of local production. They are photography, illustration, television/cinematography, audio, and duplication/printing. Local photography and illustration productions are usually limited to the 2 x 2 slide format and to titles for simple instructional sequences. Local television/cinematography productions are usually done with the least expensive system that provides the technical quality and versatility needed by the institution. Production of audio tapes and sound recordings to accompany video programs is frequently done within a Learning Resources Center. However, the major and most frequently needed local production service is for duplication and printing.

Audiovisual operations of an LRC should provide the technical assistance needed to set up, operate, take down, repair, and maintain the equipment needed for instructional purposes in classrooms or in the Learning Resources Center.

There should also be a system in the Learning Resources Center for storing and retrieving software. Ideally, the system should be designed by a librarian to assure that it is a workable, functional cataloging and retrieving system. Periodic review of the software sources, as well as the materials themselves, is needed to ensure that the Learning Resources Center's holdings are current and useable.

Facilities

The last of the five components required for an LRC is the facilities. Facilities are the buildings, the rooms, and the spaces provided for the Learning Resources Center operations. Within the LRC facilities there needs to be space allocated for learning, production, and administration.

The learning space should provide opportunities for learners to interact with media either individually or as a group. If media are to be used in the classroom, independent study areas, and practice and demonstration areas, then space is needed within each of these areas for storage of both software and equipment. Equipment that is to be used in the classroom can either be stored in appropriate cupboards located in the classroom itself or in areas near the classrooms. Equipment needed for student learning activities in the LRC should be stored in areas adjacent to where the learning activities take place.

Simulated hospital units and laboratory space where students can practice skills with children and adults should also be part of the Learning Resources Center. Also, a comfortable reading and study center is necessary so that

students can use the reserved literature and printed materials that may be housed in the LRC.

The learning spaces in the LRC should be open as long as possible to accommodate the diverse learning needs and schedules of the learners. Consideration should be given to making the LRC available in the evenings, throughout the week, and on weekends. Budgetary limitations may dictate how long the spaces can remain available, but in many instances responsible student assistants can be hired instead of full-time faculty or clerks to monitor spaces. Therefore, these spaces can be available for longer periods of time.

If production of instructional materials specific to the needs of a school is required, then space must be provided for this function. Production space may range from an office converted to a graphic arts and photography shop to an entire production center which prepares complete video tape resources for a school or campus. How much space is allocated for production will depend on the school's need and available campus resources.

The facilities of the LRC should also provide office space for the Learning Resources Center personnel. All too often this aspect is overlooked. Some of the space for personnel can be integrated into the functional spaces. For example, the office for a skills laboratory instructor may be located in or adjacent to the laboratory itself. In other cases, it will be necessary to have separate offices for the LRC personnel.

ORGANIZATIONAL STRUCTURES

The type of organization that is appropriate for any given situation depends on the philosophy and goals of the institution, the available curriculum support services, the articulation between the various components of the institution, the people of the institution, and the resources available. On some campuses, campus-wide learning resource centers are very effective, while on other campuses they are not. In these latter cases, individual schools have established their own internal support services. Some departments provide all their own services while others supplement those available through a centralized campus facility.

Each organizational structure, whether it be the all-campus organization, a school-run organization, or a combination of these two, has advantages and disadvantages. A campus-wide service can usually afford to put more resources and more expensive systems in place. Unlike the individual schools, a campus-wide service is in a better position to justify the hiring of highly skilled technical and instructional specialists. By centralizing the services of these specialists, the individual schools can make use of these experts as needed without having to pay for them on a full-time basis. With this type of organizational structure, individual schools or departments have access to a wide variety of services and talents of highly skilled expertise without having all the budgeting responsibilities. However, the competition for these centralized services can become very keen since the needs of all schools must be served concurrently.

An example of an organizational chart for centralized campus services is depicted in figure 1. This organizational model would probably be administratively part of the institution's Office of Academic Affairs. Optimally, within that central administrative office, there would be a Dean of Instructional Services. Under this Dean would be a manager for Instructional Development, one for Audiovisual Operations, one for Learning Resources, and one for Production. The Instructional Development division would work with faculty in the different departments on identifying what kinds of instructional units the faculty need to present to their students, analyzing the

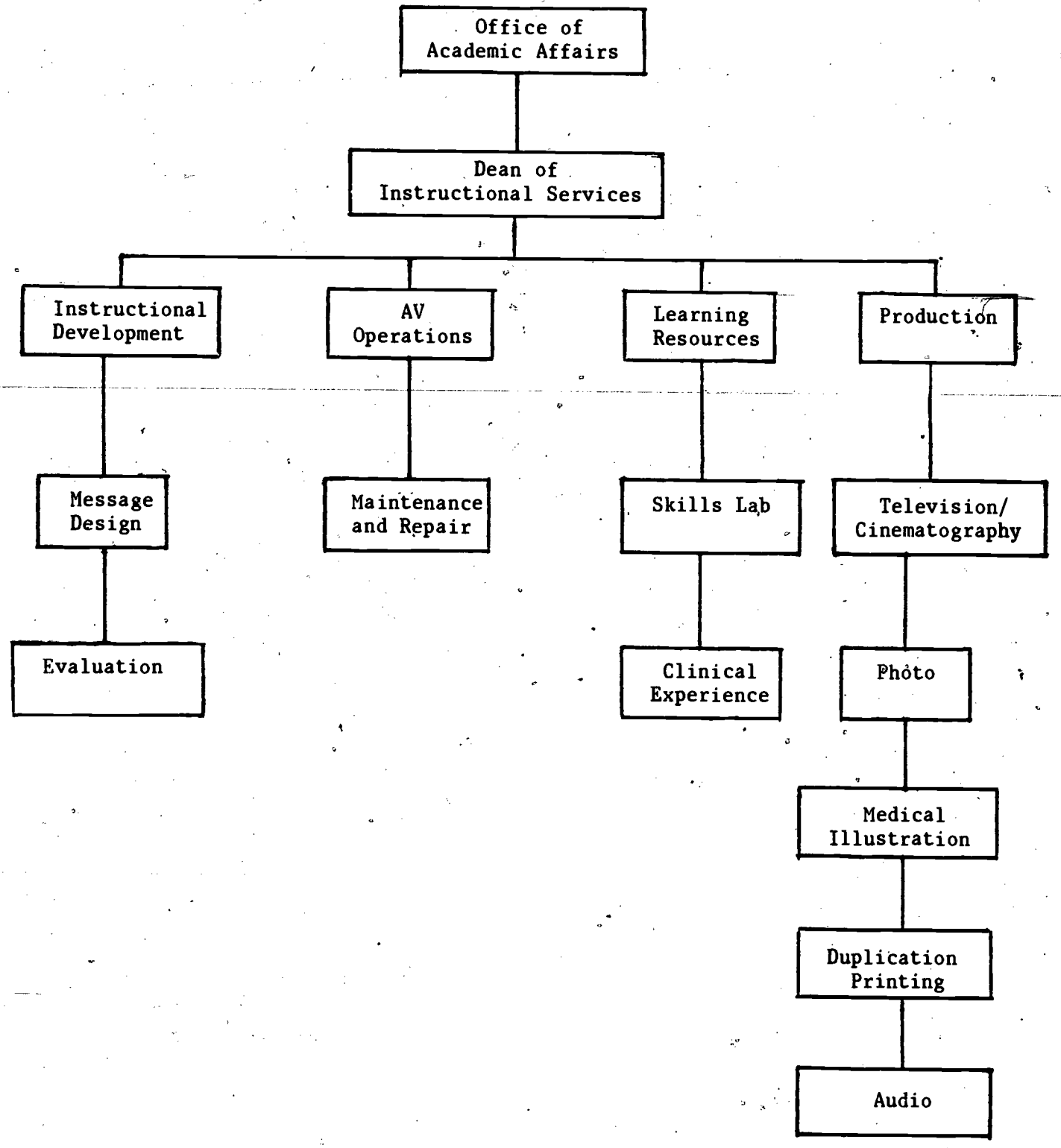

Figure 1. - A campus service organizational model.

learner and the learnings, establishing and measuring standards of performance, and providing the learning environment. This division would provide personnel and resources to assist faculty in message design and evaluation of learning. The division of Audiovisual Operations would provide AV equipment and operators for display of media in classrooms throughout the campus. If there is any maintenance or repairs to be done, it would be done by this division. If this type of campus-wide service is available, then the school of nursing would not have to establish its own maintenance and repair service which can become a very costly endeavor.

The Learning Resources division on most campuses tends to be like a library. Librarians have broadened their views, and they now provide areas in their libraries where individuals can study independently both print and non-print resources. This is an excellent direction to take.

The last division in this centralized organizational model would be Production. The manager of production would be responsible for both print and non-print media. All major media productions would be done here on whatever fee for service basis was established.

The need for an individual school to establish its own instructional support services usually begins when the campus-wide organization does not exist, is unlikely to be formed, or does not effectively or efficiently meet the demands of the individual schools for services. Even if there are campus-wide services available, a school may have a need for some additional types of speciality resources, such as a skills laboratory, that would warrant the school's establishment of its own curriculum support services.

The organization of support services within an individual school would be similar to that of the all-campus organization but perhaps not as complex. More often than not, certain elements of the organizational structure would be inherited from the parent institution. However, the people and services within a school organization would have to be multifunctional as contrasted to those in a campus-wide facility who are usually specialized.

One possible organizational structure for an individual school's support services is shown in figure 2. Applying this organizational chart to a school of nursing, there would be someone in the Dean's office, either an Associate or Assistant Dean or Dean of Instruction, who would be responsible for all aspects of the instructional program. It is important to have this person be a part of the Dean's office in order to have access to the decisions that are being made and to funding. This person would not necessarily be responsible for management of the LRC but would be knowledgeable about learning resources and represent the Dean's office on any all-campus learning resources committee.

The Director of Instructional Resources should report directly to the Dean's office and should be responsible for coordinating the within-school services, including the technical, the instructional, and the learning resources services. Of the three types of services that can be provided within a school, the learning resources is the most important. By having one's own LRC, the individual department has much better control of what is purchased and how it is used. Having control over such resources has many advantages.

Although any school can either use the all-campus facilities and services or establish its own, what usually happens is that there is a conglomeration of these two organizational models. It makes sense, economically, to combine some functions and to make certain services available on a campus-wide basis. It also makes sense to have support units in each school for the convenience of faculty and students and to maintain continuity in a curriculum.

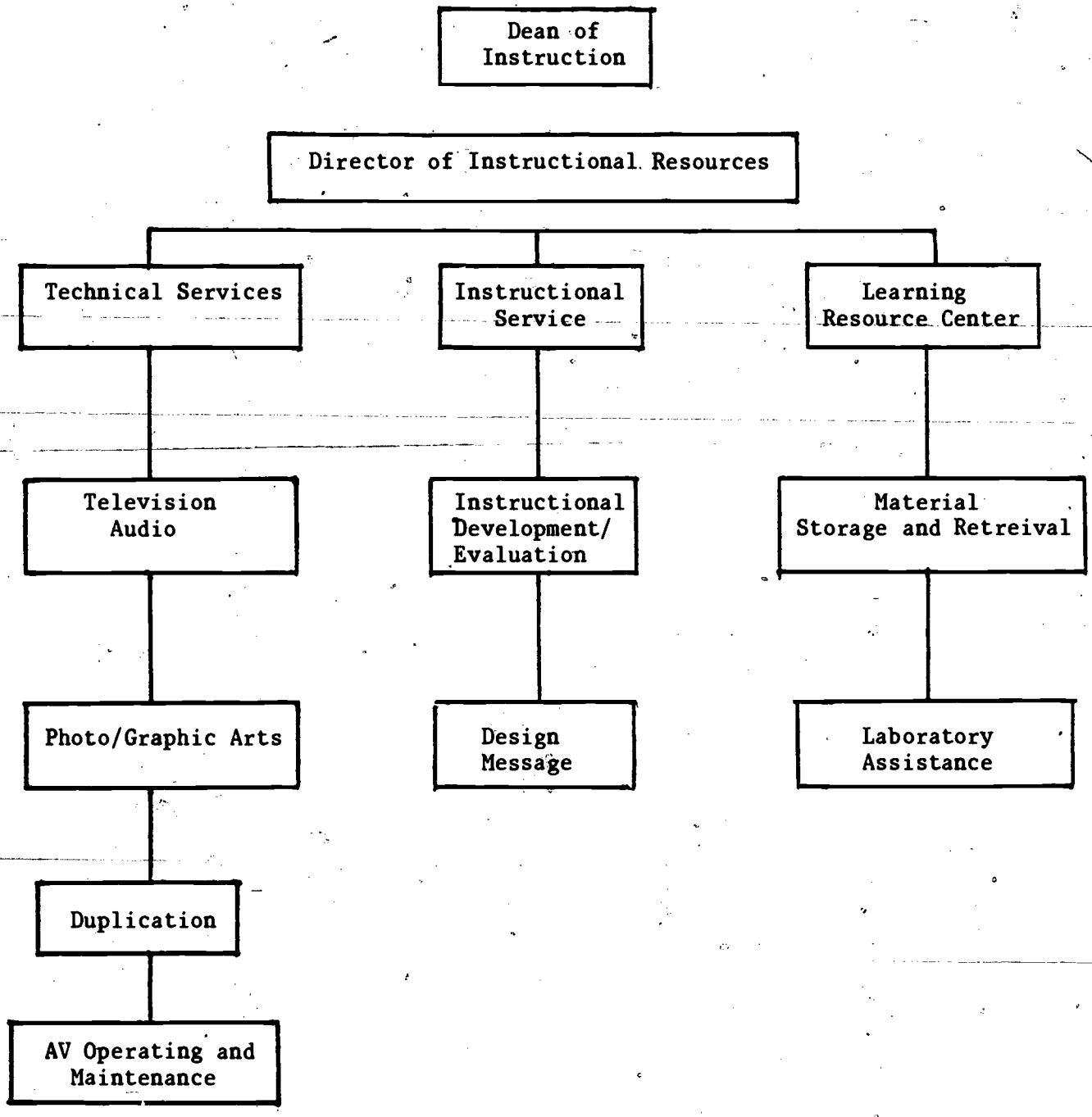

Figure 2. - An organizational model to serve the needs of a single school.

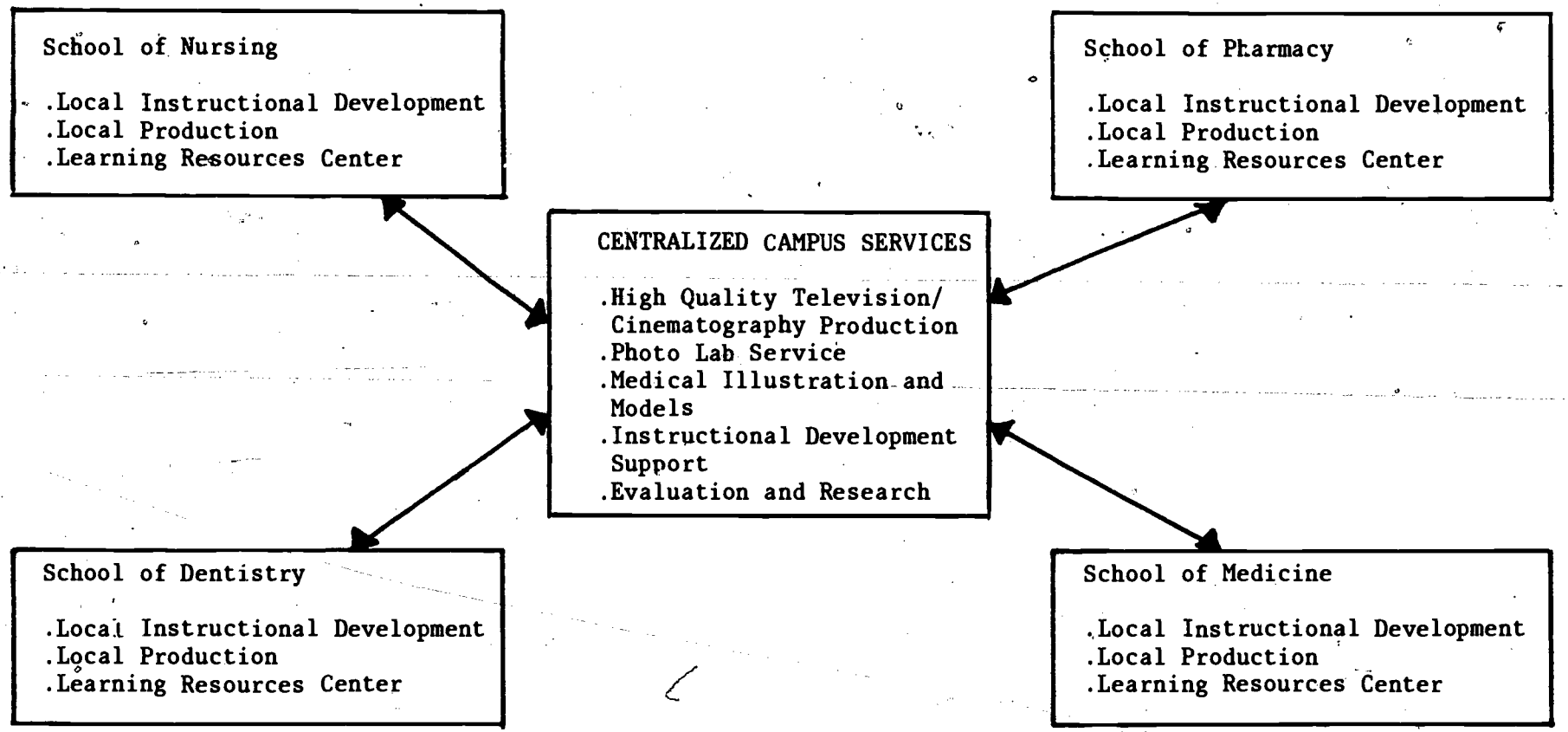

Figure 3. - Satellite units articulate with a centralized campus service.

The ideal organization, in the author's opinion, for a campus and school is depicted in figure 3. Figure 8 illustrates how satellite units in each school could articulate with the centralized campus services. Each school would have its own instructional development staff; perform selected functions such as local production of audio tapes, 2 x 2 slides, overhead transparencies, and some graphic illustrations; and have its own Learning Resources Center. The centralized services on campus would be used to support activities that are on-going within each school.

In summary, an optimum organization is one in which each school has its own resources that it can call upon but that are minimally budgeted. Each school should have people who can put together programs and who have instructional expertise in production. Local productions in each school should be limited to those requiring simple, inexpensive-type productions. Productions requiring specialized services and highly skilled individuals are more economically based in a centralized campus service. However, the Learning Resources Center is the key to the entire instructional support system, since this is where the students interact on a daily basis with the instructional environment which, ideally, has been planned and developed for them as a result of a systematic approach to instruction.

REFERENCES

U.S. Congress. House. Committee on Education & Labor. To improve learning, report to the president and the Congress of the United States by the Commission on instructional technology. Washington, D.C.: U.S. Government Printing Office, 1970.

CREATING FUNCTIONAL LEARNING RESOURCES CENTERS

Jean W. Currey, R.N., M.Ed.
University of North Dakota, Grand Forks, North Dakota

My assignment is to talk about the elements which are crucial to the creation of a functional learning resources center. I shall try to adhere to my particular assignment which may be difficult to do as all of the topics to be addressed during this conference are intertwined. Therefore, to establish the parameters of my presentation, I will not talk about the initial architectural designing of such a center, nor will I talk about budgeting in any detail. I am relieved to see that someone else will be talking about getting faculty involved in utilization of learning resources centers because I haven't found the secret to that yet. I will discuss the plain, everyday details of maintaining such a center to meet the learning needs of students and faculty, including such simple things as having batteries on hand for tape recorders that are to be used where there are no electrical outlets.

PURPOSE OF THE LEARNING RESOURCES CENTER

The first thing to consider in creating a functional learning resources center is to determine the purpose of the Center. If it is to serve multiple purposes, then what are they? For example, is the Center to provide opportunities for students: 1) to practice and learn motor skills involved in providing hygienic care to patients, 2) to view and study certain mediated programs via electronic equipment as an integral part of their assignments or as supplementary learning, 3) to do remedial work, or 4) to participate in group dynamics sessions in which TV cameras and recorders are used to provide feedback? All activities require space and equipment. Make a list of the purposes and then plan for space utilization. However, keep in mind that the purpose and kinds of activities provided by the LRC may change over time.

I cannot stress enough the importance of keeping the Center flexible. I am referring to the physical lay-out of space as well as flexibility in planning for a variety of activities which may be going on at the same time.

SERVICES RENDERED

The kinds of services to be rendered by the Learning Resources Center (LRC) will depend on the following kinds of factors:

1. Whether the Center serves the entire campus and/or is housed in a campus LRC.
2. Whether the Center is for students and faculty in the school of nursing and/or is an integral part of the space allocated to the school of nursing.
3. Whether certain media services are already available on the campus and what these services include.

Obviously one wants to prevent duplication of services. A word of caution is in order regarding the purchase of equipment commonly provided by campus media distribution centers. Some schools of nursing have purchased their own projectors, such as overhead and 16mm, for classroom use because it was more convenient for the faculty to have such equipment readily available. In my opinion, this is not an appropriate use of funds for the following reasons: 1) there is never enough equipment within a school of nursing to supply all faculty requests and thus additional equipment has to be obtained

from the media distribution center anyway, 2) services supplied by another department on campus would be infringed upon, and 3) funds would need to be allocated for the repair and replacement of one's own equipment.

A second word of caution pertains to the kinds of holdings you intend to have in your LRC. Unless the LRC is an integral part of a library or unless the library is an integral part of the LRC, a policy should be established regarding the exclusion of print media (primarily books) in the LRC. I have observed that faculty in schools of nursing want to keep certain reference books or copies of journal articles in the LRC for the convenience of students. Two problems immediately come to mind when this is done; 1) the student is not exposed to the wide range of reference materials provided in the library, and 2) this practice results in a duplication of services, as funds are already allocated to provide such services through the library.

In general the LRC provides space, equipment, supplies, mediated instructional programs in a variety of formats, and staff to serve the learning needs of the students and faculty.

PERSONNEL

It is essential that there be a person in charge of the LRC even though that person does not necessarily have to be physically present all of the time. In fact, an appointment to the LRC may be on a percentage of a full-time position. However, during the initial period of the establishment of an LRC, the task will be accomplished much more rapidly if the person in charge can be assigned full time to the LRC. Staff should be assigned to be present during the hours the LRC is open for use. The number of staff needed will depend on the services to be provided, the number of persons using the LRC, and the kinds of activities requiring the assistance of the staff.

If the plan is to have an active Center which is heavily used by large numbers of students and to build an extensive library of non-print holdings, employing a media librarian will pay dividends in services rendered to students and faculty. The media librarian will organize and maintain the cataloging system for all non-print holdings, establish the system for circulation of these holdings, establish a system for repair or replacement of damaged media, serve as a consultant to faculty and students regarding the availability of media for rent or purchase, and serve as a liaison person with the campus library. If the budget will not permit the employment of a media librarian, one alternative could be to obtain the services, on a part-time basis, of a graduate student enrolled in the school of library science. This student could help set up the library and establish the cataloging system. Once the system is established, the campus library staff could probably continue to assist with the assignment of appropriate call numbers to the new holdings that are acquired.

Work-study students can be assigned many of the repetitious types of tasks required to maintain a well-organized LRC. Such tasks include taking inventory, replenishing supply cupboards, reshelving mediated programs, checking equipment for burned-out light bulbs, preparing used linens for the laundry, reshelving linens delivered by the laundry, and assisting students in the use of equipment. Clearly defined job descriptions will do much to ensure that all tasks and responsibilities are assigned to the appropriate staff members, including the work-study students.

In recruiting staff, one may have more success in employing people if they are hired to work for a percentage of a full-time equivalent person. For example, in one Center with which I am familiar, people are employed two

mornings a week or two evenings a week, or one day and one evening a week, depending on the amount of coverage needed to keep the Center open. The persons employed are registered nurses who have had teaching experience, but for personal reasons (generally because of family responsibilities) prefer to work a limited number of hours a week.

SPACE CONSIDERATIONS

The amount of space needed for an LRC depends on how much can be obtained (since space is always at a premium), the purpose for which the space will be used, and the number of students to be accommodated at one time. It is a more economical use of staff to have the space all in one location, preferably on the same floor, with rooms adjacent to each other. Traffic patterns will also have a bearing on how the space is used.

ACTIVITIES

Activities in an LRC could probably be grouped as follows: 1) activities involved in learning and practicing motor skills related to providing physical care to patients; 2) activities requiring the use of equipment for viewing and responding to mediated programs; and 3) group activities involving use of TV cameras and recording equipment for micro-teaching, simulations, group dynamics sessions, and communications skills.

For activities relating to the learning and practice of motor skills, space will be needed for hospital equipment and simulated patient unit(s). Cupboards will also be needed for storage of linens, supplies, and patient care equipment. Cupboards at least two feet deep and four feet wide are desirable for such items. If wall space is at a premium, free-standing cupboards provide flexibility in space utilization. If self-instructional programs are used for the learning of certain motor skills, teaching machines can be placed on tables adjacent to the beds in the simulated patient units. This will enable the student to observe the teaching segment and practice the skill immediately. These tables should be wide enough to accommodate the teaching machine and the student workbooks.

For activities requiring the use of media equipment, space will be needed in the LRC for tables or carrels on which the electronic equipment can be placed. Sufficient electrical outlets should be placed along the walls and/or in the floor to accommodate the equipment. Headphones should be used with each machine.

In planning space utilization, guard against making the space inflexible by having only built-in carrels and cupboards. Portable carrels and/or tables, movable cupboards, and movable bookcases give flexibility and freedom for rearranging the space as activities demand.

For the group activities described earlier, space should be allocated where extraneous sounds and traffic will not interfere with the group activities and television recordings. If the space for these latter activities is in great demand, it may be necessary to schedule the usage of the room(s).

STORAGE

Equipment

The amount of storage space needed for equipment will depend on the amount and size of equipment available. Frequently used equipment should remain set up and located where it can be readily used. Additional equipment

can be stored where it is accessible but where it does not interfere with the Center's operations or management of people. Small items such as tape recorders and diagnostic kits can be stored in metal cabinets that have adjustable shelves.

Media

An area should be designated in the LRC for the storing and distribution of the media holdings. Free-standing adjustable book shelves, with or without backs, serve this purpose well. The shelves should be at least thirteen (13) inches deep to hold the media programs that are enclosed in large containers. Library supply companies carry a variety of containers that can be used for shelving different kinds of media. These containers simplify shelving considerably and are designed to hold individual media items as well as entire media collections.

Supplies

Mention was made earlier of the need for cupboard space to store supplies used to practice hygienic care. Other supplies requiring storage space in the LRC might be: 1) supplies used in learning specific types of patient care skills such as medical asepsis and injections, and 2) supplies needed to maintain and repair equipment and media. Supplies should be kept, whenever possible, in the vicinity of the activity for which they will be used.

SYSTEM FOR ORDERING EQUIPMENT, MEDIA, AND SUPPLIES

Equipment

Whether a separate budget item is allocated for the LRC or whether expenditures are included in the school's general instructional budget item, funds for the purchase and replacement of equipment must be included in the budget. Various approaches can be used in making equipment purchase decisions. Faculty should be involved in the decisions as to the types of equipment to be purchased. It is also advantageous to consult, before purchase, with the electronic engineers on campus. They can advise about the appropriateness of the equipment for the LRC facilities and the compatibility of the equipment with that which is already available on campus. Their advice, if followed, will not only increase the likelihood that the equipment can be used once it is purchased, but also may save costly and unnecessary installation and maintenance and repair bills in the future.

Regardless of what procedure is used to make decisions about equipment purchases, the decisions also need to be coordinated with the LRC. Coordination of equipment purchase decisions will not only prevent unnecessary duplication of equipment but will also ensure that the equipment is included in the inventory and cataloging system of the Center. Requiring everyone to justify his request for purchase of equipment is a practice in general use which has merit.

Media

The amount of media (non-print) purchased for the Center will depend on the faculty demand and on the amount of money allocated for its purchase. The choice of the subject matter, of course, is a faculty decision. How the faculty arrive at their decision to purchase certain programs differs from school-to-school. Whenever the material selected by the faculty is offered in more than one media format, the decision regarding which media format to purchase it in should be made in cooperation with the media resource personnel

in the Center. This is necessary to assure that the media can be accommodated on the equipment available in the LRC.

How does the faculty know what is available? Attempts have been made over the years by a number of universities to establish a central listing of audiovisual materials. However, as yet, these attempts have only been moderately successful. One of the services which a Center could provide is to compile a vertical file of brochures and catalogues from the various producers and distributors of media. Another service which could be provided by the Center would be to establish a system whereby faculty are notified about the availability of new media on the market. Some schools, health agencies, and libraries have established systems in which they inform each other of the new materials they individually discover.

All materials should be previewed before purchase. When a media item which has been ordered for preview arrives, the Center should notify faculty of its arrival and include a brief resume of the content in the notice. When the material is purchased, it is important to send a notice to all faculty announcing its availability in the LRC because oftentimes a single piece of software can be used in different parts of the curriculum for different educational purposes.

Supplies

An inventory list should be made of all supplies routinely required for the operation of the Center. This list should include supplies used by students in the practice of skills as well as supplies needed as component parts of the AV equipment such as batteries and light bulbs. In addition to this list, faculty should be asked to provide a list of supplies they will need based on the activities they plan for their students during the following year. This combined list can then be categorized into columns which indicate the "amount of supplies on hand" and the "projected supplies needed." Multiple copies can be made from this master list. At regular intervals an inventory can be taken of the supplies on hand and compared to the supplies needed. If necessary, supplies can be ordered. Once the LRC has a baseline for the supplies needed annually, supplies could be ordered on an annual basis with only an occasional need for interim orders.

ESTABLISHING A SYSTEM FOR MAINTENANCE OF EQUIPMENT, MEDIA, AND SUPPLIES

Equipment

All equipment for which the Center is responsible should be inventoried, even if it is not housed in the LRC. The inventory should include the serial number of each item and its original cost. The equipment should be marked so that it can be easily identified as belonging to the school of nursing's LRC.

It is very helpful to have a file containing manuals for the equipment items in the inventory. Most companies supply these manuals free. However, some companies do charge for them.

A schedule should be established for the routine cleaning and checking of all equipment. Scheduling should be based on the recommendations given by the manufacturers and on the amount of use the equipment has had. The more frequently an item is used, the more it will need to be cleaned. Although arrangements can usually be made with a campus media distribution center for servicing the AV equipment, equipment requiring frequent cleaning, such as magnetic heads of tape recorders, will need to be maintained regularly by the Learning Resources Center staff.

Replacement or repair of worn or damaged equipment should be made on a regular basis. Equipment will not last forever and there should be a plan established for gradual replacement of this equipment over time.

Each academic term, the staff should plan orientation sessions for new faculty and students who will be using the Center. Sufficient time should be allowed so that each student and faculty member has the opportunity to learn how to use the equipment properly, as attested to by a return demonstration.

Media

The longevity of media depends on the care with which they are used. Planned orientation sessions which include instruction in how to properly load the media in the equipment are well worth the time the sessions take. During these orientation sessions, students and faculty should be advised to inform the staff of any difficulties they have when operating the equipment rather than attempting to correct the problem themselves. However, despite all efforts to assure longevity, media will become damaged and worn. Therefore, it is necessary to establish a system for replacing defective media. Companies which sell media usually have policies regarding replacement and/or repair of media. An up-to-date file of persons to contact with their telephone numbers and addresses will facilitate the process of media repair and replacement.

Supplies

The task of locating supplies can be facilitated by establishing a card file system and by numbering the storage cupboards. Each supply item is listed on a different card along with the number of the cupboard in which the item is located. This simple procedure will enable anyone to locate the item.

To maintain the level of supplies required to operate the LRC, it may be necessary to order items which are in heavy use more often than once or twice a year. For these items, an ongoing record can be kept of the amount on hand. When the amount is reduced to a certain level, the item can be ordered immediately. The task of monitoring supply levels can be assigned to a certain staff member.

ESTABLISHING A SYSTEM FOR CIRCULATION OF MEDIA AND EQUIPMENT

Policies

There should be written policies regarding the circulation and use of equipment and media. For example, what equipment and what media should be kept in the LRC and what equipment and media may be taken out of the LRC? Who may take these items and for how long? Who will pay for loss and/or damage to these items? Can students and faculty from other disciplines use the LRC? May they borrow items? May members of the community use the LRC? May they borrow items? Should there be reciprocal arrangements among schools of nursing and health agencies with establishment of a shared budget for replacement due to wear and tear on the equipment and media? These questions will arise sooner or later if they have not already done so. Reasonable policies should be established in writing. As situations change then the policies may also be changed. Faculty must be involved in the establishment of these policies.

Media

In the section on space consideration, brief mention was made regarding containers for non-print media.

With the development and availability of containers of uniform sizes but with interchangeable interiors, the problems of shelving non-print media have largely disappeared. Non-print media can now be shelved in the same manner as print media. The media should be shelved according to some system of classification. Titles and the call number of the program should appear on the spine of the container. Book cards, similar to those used for library books, but labeled with the appropriate medium, can be placed in library type book pockets attached to the containers.

Open shelving of media permits students to browse and to obtain the programs they wish to view. The checkout and return system should be an integral part of the orientation program provided for new students each semester.

Equipment

Equipment which may be taken out of the LRC can be cataloged and circulated in a manner similar to that used for media. For example, most pieces of equipment are large enough to permit the attachment of a library book card pocket. For those pieces of equipment which do not lend themselves to the attachment of a pocket, other means can be employed for identifying the item, such as engraving or painting a number on the item itself. The checkout cards for the equipment can be maintained in the card file at the circulation desk.

MAINTAINING COMMUNICATION WITH FACULTY

A mechanism should be established within the institution that provides for regular, ongoing communication between the LRC staff and the faculty. Communication is vital if the Center is to meet the needs of faculty and students. Announcements, faculty committee meetings, newsletters, memorandums, personal contacts, and bulletin boards can all be used as vehicles for communication about the LRC.

Faculty members need to be involved in planning, utilizing, and evaluating the learning activities that occur in and the services provided by the Center. Faculty members need to be involved in the LRC orientation programs, budget planning, equipment and media purchases, space allocation decisions, and policy formation sessions. The greater the faculty involvement, the greater will be their support for the Center.

In summary, it takes much planning, communication with faculty, and faculty involvement to create a truly functional Learning Resources Center, but the rewards are worth it.

The following three papers were presented as a panel. Each speaker addressed different approaches which could be used to get faculty involved in LRC's.

GETTING FACULTY INVOLVED IN LEARNING RESOURCE CENTERS: A CONCEPTUAL FRAMEWORK

Jean J. Mason Kaufman, R.N., Ph.D.
Rush University

Schools of nursing across the nation have invested hundreds of thousands of dollars in the design, building, and staffing of multi-media learning resource centers (LRC's). Present LRC's are an outgrowth of traditional nursing arts and nursing skills labs which have been tempered by the influences of language labs and the multi-media movements of the late 1960's.

Administrative commitment to LRC's has been of great magnitude, but utilization, in many cases, has not followed this commitment. Learning Resource Centers help to meet individual differences in learning styles and thus, have "come of age" both philosophically and practically. Coming of age connotes maturity. Maturity demands accountability! It is reasonable, at this point, to ask "accountability for what"? One answer is accountability for cost effectiveness (in this age of the shrinking dollar) and learning effectiveness (as the cost of education rises). Primary goals of both educators and administrators in nursing today must be to maximize learning and to minimize cost!

What strategies can we use to accomplish this goal and where do we go for help? It would be natural to turn to the literature to discover what strategy works best. There is, however, a dearth of research in nursing in the areas of cost effectiveness and learning effectiveness which are related to learning resource centers. Even descriptive research is of little value. Then where do we turn for help to meet the challenge and to increase the effectiveness of Learning Resource Centers?

The purpose of this paper is to explore a conceptual framework which should increase the commitment and the involvement of faculty in the utilization of Learning Resource Centers in Schools of Nursing. Research does support that there is a direct correlation between faculty commitment and student involvement in these centers and that a correlation also exists between student involvement and learning.

This paper will address, therefore, the issues of faculty commitment, strategies to improve faculty motivation to use the resource center, and guidelines for increasing faculty utilization.

A PHILOSOPHY OF GETTING FACULTY INVOLVEMENT

Faculty changes can occur in many ways. Some are changed through revolution (or autocratic imposition), while others are changed through evolution (or the democratic process). Lasting change is successful only when each person who is involved is committed to the change. A revolutionary change often yields passive-aggressive responses which tend to undermine the decision and frequently lead to program failure. Evolutionary change, however, is designed to produce lasting success. The components of evolution include the

democratic processes of group planning and sharing of ideas, the examination of alternative plans and their implications, agreement upon the chosen alternative, and implementation and evaluation followed by revision. Contrary to this, pressures such as decreased access to instructional materials and services and large measures of guilt yield faculty unhappiness and consequently decreased use.

The primary components of getting faculty involved in utilizing an LRC are:

1. A well planned, well organized, time efficient LRC.
2. Personnel who are pleasant, approachable, and helpful.
3. Hardware and software which are reliable because they are in excellent working conditon.
4. Administrative commitment to rewarding instructional and learning excellence.
5. A faculty development program which is both individualized and flexible in time and style.
6. An overall faculty attitude of growth toward excellence.

The groundwork for faculty involvement needs to be laid by the administration, and the administrative expectations need to be supported by dollars sufficient to meet basic instructional and learning program needs. At the learning center level, the groundwork includes selecting and rewarding personnel who are supportive and friendly to users of the center. This is an affective criterion which must be demonstrated by the LRC director as well as by the staff. Frequently, a peer relationship will increase faculty bonding especially when the LRC director is appointed to a faculty position and also serves on the educational resources and curriculum committees.

The planned process of evolution for success includes maximizing the use of the LRC resources, selecting faculty who fit the curriculum needs, and programming growth in small enough steps so that it remains non-threatening to those who do not function well when buffeted by the waves of rapid innovation.

The most successful plans for evolution include application of the instructional development process to faculty planning. A thorough analysis of curriculum needs should be followed by a three to five year plan for systematic growth. This plan should include simultaneous thrusts for LRC facility growth, LRC service growth, and overall faculty development. A blueprint of successive approximations should move faculty commitment and LRC growth from the existing to the desired state over a specified time frame.

However, in the final analysis, faculty will become involved in the LRC, in direct response to both peer and administrative commitment, only to the degree that they perceive both intrinsic and extrinsic rewards in doing so.

GETTING FACULTY INVOLVED IN LEARNING RESOURCE CENTERS: A CASE STUDY

Carol Casten, R.N., M.S.N.
Triton College, River Grove, Illinois

Triton, a public community college in the western suburbs of Chicago, has not one, but three different Learning Resource Centers which are utilized by the School of Nursing faculty and students. They are: 1) the Learning Resource Center, a campus-wide facility which provides comprehensive support services, 2) a Nursing Learning Resource Center (NLRC) which services the specific learning needs of nursing students, and 3) an Allied Health Learning Resource Center (AHLRC) which provides the educational media resources for both the allied health students and the allied health professionals employed in the western part of Cook County. The purpose of this paper is to describe how these Centers interrelate and how faculty utilize each of the three different centers to meet the learning needs of their students.

LEARNING RESOURCE CENTER

The six main service areas in the Learning Resource Center are the Library, Cernan Space Center, Audio Visual Services, Independent Learning Lab, Graphics, and Media Production Center. In addition to the more traditional library services, the Library contains a Faculty Development Center and a Film Library Information Center. The Cernan Space Center contains classrooms, a display area, and a fully equipped sky theater. The Audio Visual Department located in the Learning Resource Center provides the audio visual equipment, films, and videotapes for all the instructional programs in the college. Audio visual equipment can be borrowed from this department on a 24-hour personal loan basis. Faculty may reserve equipment and materials for instructional purposes simply by calling the Audio Visual Department.

The Independent Learning Lab section of the Learning Resource Center houses a variety of instructional programs, independent study modules, and supplementary course materials for nursing and non-nursing courses. Listening stations which are equipped with the necessary playback equipment are available in the Lab for individual student use. Selected nursing materials (non-skill oriented) are duplicated and made available in the Lab for use by nursing students. The Independent Learning Lab is open more hours per day than is the NLRC and thus the learning materials in the Lab are used heavily by nursing students. Nursing students are also encouraged to utilize the resources in the Library for reading and reference materials.

The campus Graphics Department designs and produces the art work for posters, slide/tape programs, transparencies, television, and photography or for whatever instructional need may arise. The Media Production Center produces a variety of supplemental instructional media programs for the faculty of Triton College. Included within the Media Production Center is a professional color television studio, a black and white television studio, portable video equipment for "on location" work, 16mm film production equipment, and radio station WRRG (FM-89).

The nursing faculty use the Learning Resource Center in various ways. The original Faculty Development Center, on the Triton campus, was a section of the Independent Learning Lab. The materials in the Development Center were

specifically designed to help faculty write behavioral objectives. Thus, when the faculty revised their course outlines, they needed to enter the Independent Learning Lab in order to utilize the materials contained in the Faculty Development Center. Their physical presence in the Independent Learning Lab helped to make them aware of the valuable services the Independent Learning Lab had to offer. Thus, the faculty themselves have become involved in the use of the LRC.

All floors of classroom buildings have a phone line directly connected to the Audio Visual Department in the Learning Resource Center. Whenever faculty encounter difficulty in operating the audio visual equipment, they just need to phone for assistance. Within ten minutes an audio visual technician is dispatched from the Audio Visual Department to the classroom or laboratory. New faculty members have indicated that this quick response gives them the support they need as novices in the use of audio visual aids.

The Media Production Center of the Learning Resource Center has been used by the nursing faculty to produce, with the assistance of a media technician, videotapes of selected nursing procedures. The Media Production Center houses a mock-up of a hospital room and a utility room which faculty use for videotape productions.

NURSING LEARNING RESOURCE CENTER

The NLRC is an integral part of the Associate Degree Nursing program. It is located in the Health Careers Building which also houses faculty offices and the majority of the classrooms. Its location makes it readily accessible for use by nursing students.

The purpose of the NLRC is to augment the students' classroom and laboratory experiences by providing opportunities for students to see, hear, and do according to each person's own learning pace. Print and non-print materials are available in the NLRC to help the students prepare for their clinical experiences.

The NLRC consists of two areas: an audiotutorial laboratory where students see and hear procedures demonstrated via media, and a nursing laboratory where students can practice the nursing techniques they have learned.

In the audiotutorial laboratory each carrel contains a tape player and a slide projector. Equipment is also available for showing 16mm films. From the very beginning of their employment, faculty are encouraged to utilize the resources in the audiotutorial laboratory. As a result, class time is rarely taken for viewing media; however, class time is often devoted to discussing the media that have been viewed. The second part of the NLRC is the nursing laboratory. This area contains the physical items necessary for practicing the techniques that are explained in the media lab. Specifically, this area contains beds, set-ups for intravenous infusion, medication "mock-ups", and anatomical and simulation models. Oftentimes in this setting, one student will assume the role of the patient while another student will practice the procedure. Then they reverse their roles so that both students gain some actual experience in each activity.

The personnel of the Nursing Learning Resource Center consist of a supervisor, a clerk, a student aide, and faculty.

The Supervisor presides over the NLRC. She is in the center at all times and is available to students for individual help. She is a nurse and is fully qualified to answer any questions the students may have. Her responsibility is to oversee the operation of the NLRC and to assist faculty in screening media, developing new programs, and updating old ones. The atmosphere of

openness that is fostered by the Supervisor is the key to faculty and student participation in the NLRC.

An audiotutorial clerk is present at the circulation desk at all times and is of immense value to faculty and students who need assistance. A large number of the learning experience guides for the programs are available for students' use, and students are free to view them and replace them on shelves as needed.

Faculty members who are on the first year teaching team, specifically those teaching fundamentals of nursing, are assigned to the nursing laboratory. The names of faculty who are available for tutorage of nursing students are posted in the center for all to see.

The faculty observations of student learning patterns have been extremely rewarding and have served as incentives for faculty to develop new ways of teaching. For example, faculty developed a game board which students used to play jeopardy with the signs and symptoms of major health problems. Other health related games are also available in the NLRC. Faculty are encouraged to engage students in game playing whenever the students are waiting to use specific areas in the NLRC. It usually takes no more than twenty minutes for the faculty to review and to acquaint a student with a game and the results are very rewarding.

The key to faculty working with students in the NLRC often rests with the team leader for the teaching team. Fortunately, the teaching team leaders on our faculty have been very enthusiastic and this has done much to foster good utilization of the NLRC.

During the pre-service orientation, the faculty are acquainted with the NLRC through the use of a videotape. The videotape gives a tour of the NLRC and explains to the faculty the golden opportunity they have for utilizing educational technology in assisting nursing students from a variety of educational backgrounds and at various levels of maturity. This initial encounter is just one way in which faculty are encouraged to identify individualized needs of students whenever they are in the NLRC.

The school also uses graduate students from a nearby university in the NLRC. The graduate students work in the NLRC as part of their teaching practicum experience. Opening our doors to these graduate students has stimulated their interest in the concept of a Learning Resource Center and has allowed them to become actively involved in a variety of NLRC projects.

Because faculty are readily available, the nursing students use the skills laboratory at times which are convenient to them. Students are also assigned to the laboratory for specific procedural demonstrations and to return demonstrations. Student progress is evaluated through the use of weekly assignments which are accompanied by objectives and study guides.

All media that are in the NLRC are carefully selected by the faculty. Film festivals are held periodically so that faculty can preview the new media that are available. A marquee technique, including lights, is used to announce what materials are available for preview. Popcorn is provided to those who attend.

Prior to the beginning of each semester, appropriate faculty members give a copy of the course outline to the NLRC Supervisor. Each outline lists the media programs to be seen by the students along with the dates that they are to be available if rental is necessary. The Supervisor follows the outline and sets up the programs several days in advance of when students are required to view them. She also will make the programs available if the students want them at other times.

Through this approach to learning, many students have become independent learners. Many have become better students through their ability to identify their own specific learning needs and, as a result, seek faculty guidance in the transfer of learning.

To get the faculty involved in media production takes some ingenuity. Initially, our faculty thought they wanted to do their own TV productions. However, in order for them to be able to do this, it meant that they needed to learn to utilize the TV camera and to learn technical production skills. Many faculty used the TV camera and, consequently, there were times that it was unavailable for use due to repairs. The faculty have since abandoned their videotaping of clinical skills. This decision was based on input from student evaluations of the Nursing Learning Resource Center which indicated that the laboratory was "tied up" a great deal of the time for television productions, prohibiting students from using the facility for practice of clinical skills.

One of the ways our current NLRC Supervisor encourages faculty to utilize the AV equipment is to put the faculty pre-service orientation to the School on slides. This way faculty actually have to utilize a slide projector in order to view the material.

During each semester, the Coordinator of the nursing program discusses the utilization of the NLRC with each faculty member. The Coordinator also encourages the faculty to videotape their classes from time to time and has upon occasion asked various instructors, who are effective in small group discussions, to tape their sessions so that other faculty could learn from these videotapes.

Cooperation among and between the personnel in the audiotutorial laboratory, the nursing laboratory, and the main LRC on campus is essential as faculty become discouraged very quickly by ineffective professional assistance.

Each semester faculty and students are requested to evaluate, in writing, the NLRC. In follow-up studies, the nursing program graduates have been asked to respond to questions about the services of the Learning Resource Center while they were students. A suggestion box is also available in the NLRC.

ALLIED HEALTH LEARNING RESOURCE CENTER

The purpose of the Allied Health Learning Resource Center (AHLRC) is to promote excellence in health care through development of cost effective sharing of educational media resources. The AHLRC functions as a Consortium which serves Triton's allied health students, as well as professionals in the community.

The current Consortium membership consists of eleven hospitals, six nursing homes, and a community mental health center. To be eligible for the Consortium, health care institutions must be in the Triton College district and/or accept Triton College students for clinical laboratory learning experiences. Members of this Consortium work cooperatively in sharing their media resources, and they collectively advise on the purchase and development of educational programs for the allied health (and nursing) students and the professionals in their respective institutions.

One of the interests of the center is the improvement of health care in area hospitals and nursing homes. The center's resources--books, audio and video software and hardware--are available to hospitals and nursing homes. A comprehensive catalog which lists all media that are available through the AHLRC has been compiled and distributed to each Consortium and allied health faculty member. In addition, each participating health agency has been provided with, or has immediate access to, the equipment necessary to utilize the

various disseminated media programs. Delivery and retrieval of media and hardware are provided three times weekly to the institutions to facilitate convenient access to the materials and efficient resource utilization.

The AHLRC also provides continuing education for health professionals in the western Cook County area. Emphasizing the independent adult learner, the AHLRC provides courses, workshops, and seminars in response to identified educational needs. They also provide multisensory programs in the form of films, videocassettes, audiotapes, filmstrips, slides, and written materials. The facility has individualized study carrels, group viewing areas for films, conference rooms, and a reading area as well as an area for media storage. Registered nurses in the community use the AHLRC for review as well as a means for augmenting courses, workshops, and seminars.

The AHLRC also is involved in production of materials to enhance learning. Technical expertise and production resources are provided the Allied Health faculty and Consortium personnel for cooperative development of multisensory educational programs not available commercially. To insure that the AHLRC has the most current information available, a comprehensive file of commercial media, catalogs, and brochures is maintained. By serving as a clearing house for purchasing and disseminating educational resources, the AHLRC strives to eliminate duplication of media acquisitions and works to facilitate resource sharing.

The AHLRC was made possible through grants that the school received about four years ago. These grants also helped pay for many of the resources that the AHLRC has.

The value of this Allied Health Learning Resource Center to the Triton School of Nursing faculty is immeasurable. The faculty have an opportunity to utilize materials and media from the Consortium members and can also give of their expertise to productions for the other Consortium members. The faculty have initiated, through the Consortium, the production of several videotape programs. Some of these are being used for patient and staff education in the Consortium health care agencies.

When possible, I as the chief administrator of the nursing program give encouragement and support for faculty involvement in the utilization of media. For example, while attending class recently, I noticed that a faculty member was very effective in providing information to the students regarding the Blood Assurance Program, the American Red Cross, and the role of the registered nurse in parenteral therapy. Since the nursing students were fascinated by this class, I thought that members of the AHLRC Consortium might also be interested in the content. Therefore, I asked the instructor to contact the media specialist in the Consortium about producing a program on this content which will eventually be shared with members of the Consortium.

Another way that I am currently providing support for faculty involvement with the LRC's is that I am attempting to develop a proposal for release time so that faculty can, with the assistance of the Supervisor in the NLRC and the media staff in the campus LRC and AHLRC, produce media for those areas of the curriculum where new media are needed. Although clincial expertise and production resources are provided for faculty to cooperatively develop multisensory educational programs, time is a concern. A rationale is being proposed for release time so that media production could be considered as a part of the faculty's involvement on campus, and not over and above the many hours they already spend in their instructional activities.

In summary, the philosophy of the LRC on the Triton campus is to involve as many faculty in its policy and procedures as possible. Some of the nursing

faculty serve on the all-campus LRC Committee. The faculty have gained increased information and interest in utilization of educational technology by attending workshops and seminars offered by the college.

As Coordinator and administrator, I indicate to faculty that their guidance of students in the NLRC can be the key to active participation in the learning process, and that learning as a self activity should meet the goal of a competent, confident practitioner who will graduate from the Associate Degree Nursing Program. Providing a variety of resources that are designed to assist faculty in the teaching-learning process is the goal of the Library, the Audio Visual Services, the Independent Learning Lab, Graphics, the Media Production Center, and in particular, the Nursing Learning Resource Center.

The faculty's rewards for involving themselves with these resources are students who are eager to learn. Students have discovered that learning is more effective when they use the audiotutorial approach and make use of the support services offered by the Independent Learning Lab and the Nursing Learning Resource Center.

As the Coordinator and the chief administrator of the nursing program, I will continue to utilize a variety of strategies to increase our faculty's utilization of learning resources, because this is what I believe is essential to the role of the modern day teacher.

GETTING FACULTY INVOLVED IN LEARNING RESOURCE CENTERS: A CASE STUDY

Kay L. Carbol, R.N., M.S.N., M.S.
University of Utah

When one considers the fact that film, in some form, has been available to educational institutions for more than half a century, it seems a bit ludicrous that one would find the need to discuss the topic of getting faculty involved in the use of media. Nevertheless, while the literature does reveal a trend in the direction of increasing use of media and the development of learning centers in schools of nursing, too few are organized, planned, and budgeted as an integral and ongoing part of the total curriculum. And while the future appears more hopeful than it has in the past, too many learning centers are still peripheral, adjunctive, ad hoc enterprises. Why, in view of the predictions made regarding the use of educational media in the early 1960's, does such a situation exist? In an attempt to answer this question I first took a studied look at my own school. In exploring old university bulletins, publications, and theses done in the area of instructional media, some interesting facts and relationships unfolded. For example, the University of Utah obtained its first films in the year 1916 and the purpose cited was to "experiment with the motion picture" as an aid to education (Hadlock, 1950). A search of publications of the 1920's, 1930's, 1940's, and 1950's revealed purposes such as acquiring and renting films, circulating films, and giving assistance in the operation of equipment. It wasn't until the late 1960's that a specific statement was found relating to the notion that the Media Services Department (as it had come to be known) existed for the purpose of assisting with and improving the teaching-learning process (Evans, 1958-1969).

While in the 1970's I believe we, like most, have done some things right, that is, moving in the direction of utilizing learning resources in an integrated, systematic, organized way, much continues to be done as ancillary, substitute, and peripheral to the teaching-learning process. What this short excursion into the history of media utilization in my own university did for me was to identify a glaring omission, and that omission seemed to fit the subject under discussion here today, the subject of faculty involvement in Learning Resource Centers and the use of instructional media. But how much--how involved--can we expect faculty to become if, in fact, they have not been properly instructed? It seemed appropriate, therefore, to look at the area of faculty development.

It would appear, at this point in time, that faculty development simply must be provided within the university and that development must be in the areas of curriculum and the teaching-learning process. This is easier said than done. For one thing, it is assumed by most that, as a member of a profession, one has the responsibility to keep informed; it is further assumed that, as a member of academe, one has some access to means for continued development. This may be in the form of a sabbatical leave, renewal programs through various grant fundings, or professional and university travel-study appropriations. Another problem identified by many, and recently brought to our attention in an article by Hipps (1978), is the "antipathy of many faculty members toward anything tainted by pedagogy" (Hipps, 1978). Finally, there is the idea, erroneous as it is, that one can improve, excel, and increase teaching effectiveness simply by expanding one's knowledge of one's chosen discipline. Colleges of nursing are finding more and more that many faculty assume teaching positions without ever having had a single course in curriculum or

the teaching-learning process. This is probably due, in part, to the emphasis we, in nursing, have placed upon the "practitioner" component in recent years as the "in" thing and a kind of derogation of the teaching role. This particular point is rather well illustrated in that old cliche "those who can - do; those who can't - teach".

What can one do about it? It would appear that individual situations call for individual solutions. However, here are some common approaches:

1. Secure firm administrative commitment, and support of at least a small group of faculty, before beginning a faculty development program in curriculum and the teaching-learning process. Trying to change ideas and approaches which have been held sacred by faculty for years is, under optimal conditions, difficult. Without support, it may be impossible.

2. Designate the Director of Learning Resources as a permanent member of every curriculum committee--undergraduate, graduate, and continuing education. This is, of course, time consuming but the Director does then have input into curriculum decisions regarding instructional media and is able to develop a great deal of insight regarding faculty beliefs and needs from an individual as well as a collective viewpoint.

3. Establish a faculty training program or at least a series of instructional classes. This works best if such a program has been identified as a need, it is sanctioned and supported by both faculty and administration, and time has been allocated for it. This is important. Faculty are busy people. Find a way to release them from other less important activities.

Perhaps this is the time to make a statement about the preparation of the kind of person who should be in charge of a Learning Center in a College of Nursing. The scope of the nurse-media Director's duties is broad, reaching literally to all aspects of the school's varied programs and mandating a number of competencies based upon:

1. Broad knowledge of print and non-print materials.
2. Comprehension of the broad spectrum of media and their place in the educational process.
3. Knowledge of and insight into learning theory and communication processes.
4. Knowledge of curriculum structure and development.
5. Professional education and background in nursing.

We are long past the time when a technician or a media librarian can organize, manage, direct, and teach in a discipline, such as nursing, for which he/she is not prepared. Of course it is possible to combine talents and characteristics in a number of people but it is the director who has the greatest influence upon and input into decision and policy making. The type of media person needed may differ depending on the type of existing organizational arrangement (a university-wide Learning Center or a center located within the confines of the individual school). Nevertheless, careful attention to the preparation of personnel in the Learning Resource Center (LRC) is an important factor in success. For example, many schools simply hire a registered nurse to teach basic nursing skills in the LRC based on the thinking that if one knows how to perform a procedure, one can successfully teach it to others. While this rationale may be construed as an attempt to assist students, it may actually serve as an impedance in terms of future learning. I seriously question the validity of such thinking. The question which needs to be asked in this situation is who, if anyone, is equipped to and, in fact, does identify students' learning problems when they occur? This persistence of traditional patterns of instructional organization and practice can only be reversed by

faculty instruction and faculty involvement. Since access to both facilities and services is necessary if one is to change long-time behavior and practice, thoughtful structuring of both is the place to begin. At this point I would like to offer as a kind of case study and example my own facility in the College of Nursing, University of Utah.

The Media Services Department of the college, which includes the learning lab complex and the television production studio, has been in existence as an organized unit for five years. The central lab and all related viewing, production, and storage areas occupy 12,000 square feet of space in the College of Nursing building. Included is a large psychomotor skills lab with nine simulated patient care stations and six mobile learning stations. The mobile stations are set up at the request of the faculty and follow the curricular sequence. They are dismantled, generally at the end of the quarter, to be followed by requested stations for the subsequent quarter. Four additional rooms are equipped for small group and/or individual viewing. The film viewing room contains two projection pathways, one for 16mm films and one for the dual screen, rear projection Omni Learning System. Three rooms contain 3/4" cassette video playback units. The independent study area is equipped with twenty-eight carrels, fifteen of which have varying types of equipment for self-paced study including 35mm slide projectors, super 8mm loop projectors, audio tape players, headsets, and microfiche readers. The remaining ones are open study carrels.

Recent emphasis in nursing curricula on the teaching of physical assessment and examination skills necessitated the development, in the autumn of 1975, of a physical exam station. Beds, adult and pediatric exam tables, and exam equipment such as stethoscopes, otoscopes, ophthalmoscopes, sphygmomanometers, tuning forks, and percussion hammers make up the station. Also available are manikins for practicing resuscitation, a trauma head, and a pelvic model.

In order that students might be able to view their own functioning and practice, especially in the areas of interpersonal skills, interviewing, and history taking, an auto-critique station has been developed. This station is equipped with a Sanyo Porta-Pak system consisting of video camera, recorder-playback, and monitor. The system uses 1/2" black and white cassettes which can be used over and over, thus reducing cost. It is easy to operate and most students and faculty can manipulate the equipment after a single instructional session. The college inventory contains two such systems, one permanently located in the station and the other for use mainly by the department of continuing education in outlying areas, hospitals, and agencies.

In teaching courses such as nursing where human subjects are involved, two factors become readily apparent. The type and selection of learning experiences are dependent upon the existing patient population at the time the student is in the hospital for clinical experiences and the critical nature of some patients, e.g. high risk situations which do not always permit student intervention. With this in mind and with encouragement from administration, the faculty of the graduate Physiological Nursing area in conjunction with the Director of Learning Resources developed a simulated cardiovascular intensive care unit. The unit was equipped with a recording resuscitation model, an arrhythmia trainer, an oscilloscope for reading taped EKG strips, and a defibrillator, as well as standard AV equipment including a 3/4" cassette video playback unit, 35mm slide projector, super 8mm loop projector, audio playback units, and headsets.

Because of the difficulty in scheduling experts for teaching the highly specialized content in cardiovascular nursing, a series of 135 half-hour video

format lessons were produced by the media department of the college. Using the approach of combining these materials on a self-paced schedule along with small group discussion sessions, the faculty of the Physiological Nursing area were ultimately able to program nine credit hours. The results of a recently completed three year study on "Utilization Patterns of Mediated Instruction in the College of Nursing" (Carbol: 1977) showed a surprising number of faculty using selected segments of the cardiovascular series. While this was not planned specifically as faculty development, it, nevertheless, contributed to it. In an effort to involve all areas and programs within the college, a satellite lab apart from the main lab was developed for the graduate midwifery students and is equipped with a variety of simulation models peculiar to that subject matter such as pelvic, pregnancy, delivery, and palpation models.

The Learning Resource Lab of the College of Nursing is identified as a curriculum support facility. It is designed to assist faculty and students in the use of the variable modalities of mediated instruction. The Director of Learning Resources, prepared in both nursing and media, provides assistance to students in the selection and use of instructional materials and acts as consultant to faculty in the utilization, selection, development, and production of mediated materials.

Equipment and facilities must be used in order to prove their worth. In order to avoid the chaos and dissonance which result from poorly structured or loosely organized situations, a learning sequence was established. Students begin the sequence with the theory portion of the lesson. While many lessons are presented via a single format, some use a multi-media approach and some appear on alternate formats. The variety of formats is viewed as a positive feature of the learning process. Following the completion of the theory unit, the student enters a test station in the main lab and completes a paper-pencil test. The individual student's clinical faculty member is responsible for grading the test and providing feedback to the student. Failure to pass the test requires reworking the lesson and/or faculty consultation. Upon satisfactory completion of the test, the students self-pace themselves through the skills lab. The simulated patient care stations are arranged in an ellipse configuration necessitating the services of only one faculty member for general practice sessions. When the student is confident that she/he has mastered the skill, an appointment is scheduled with the student's faculty member, if available, or with another faculty member assigned to the lab. Upon satisfactory performance of each skill in the simulated situation under the careful observation of the faculty member, the student is then ready to perform in the hospital or other clinical agency. The learning sequence established is illustrated in figure 4.

Variations in sequence occur in the strictly cognitive and in the affective domain lessons. Establishment of an appropriate learning sequence is not only the prerogative but the responsibility of the department and/or individual faculty member. Generally, the following sequence is used for lessons in the cognitive and affective domains. (See figure 5.)

At the risk of sounding contradictory, I believe that an established learning sequence puts some order and structure into what otherwise might be not only unstructured, but excessively loose to the point of being chaotic and, thus, unproductive. It also permits new faculty to enter into the existing situation with greater ease since it provides some parameters within which they can function, thereby involving them in the LRC earlier than they might otherwise have been.

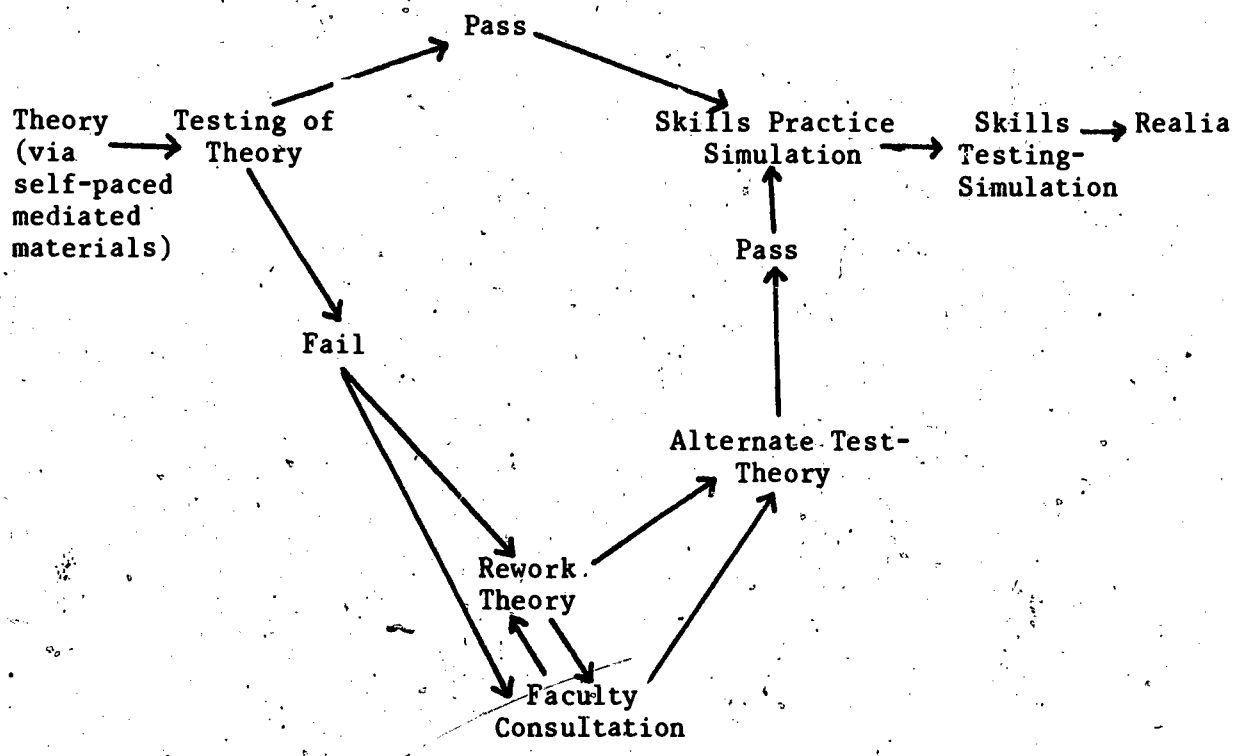

Figure 4. - Self-paced learning sequence for psychomotor skills.

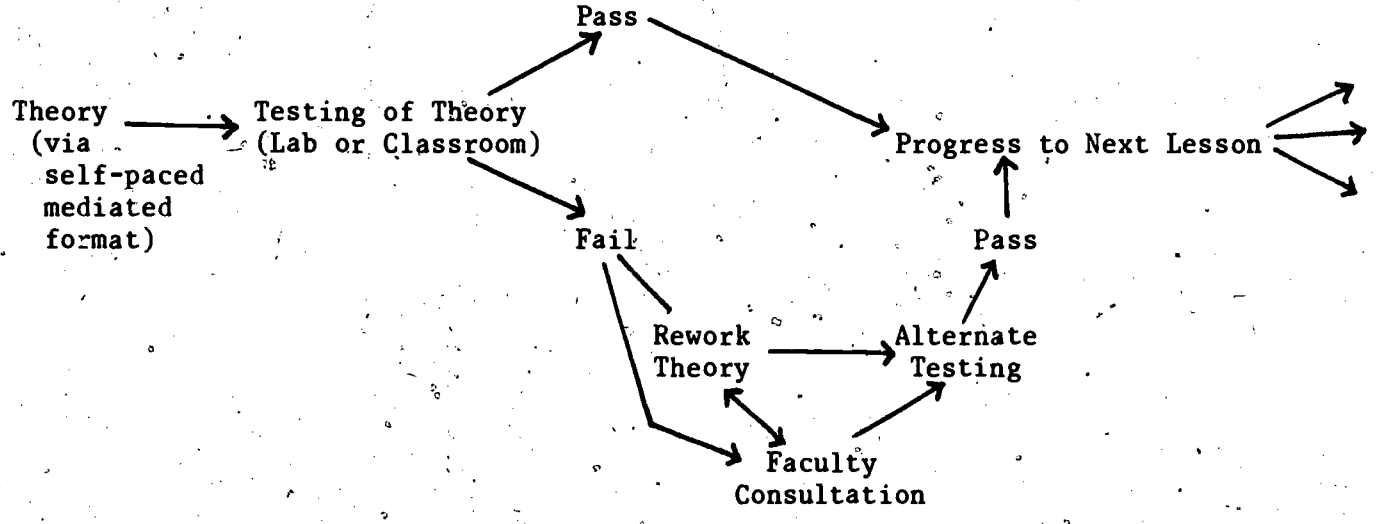

Figure 5. - Self-paced learning sequence for cognitive and affective domains.

Realizing that producing materials for one's use within the school also contributes to faculty involvement, the College of Nursing moved in that direction. The media department maintains its own television studio comprising 1,200 square feet of space. Studio facilities include two one-inch video playback-recorders, two 3/4" video cassette recorders (all with editing capability), two color and two black and white studio cameras, a film chain, video switcher with special effects, and lights and terminal equipment as required for color and black and white production. Underground cable connections exist between the College of Nursing, College of Pharmacy, College of Medicine, University Instructional T.V., and KUED, a radio and television station for the University.

Production support systems include a film room set up with a copy stand, lights, and a 35mm camera with lenses for copy work, titling, and so forth. It also serves as a processing room for 35mm slides and Kodalith film. A small graphics lab is equipped with various drawing and printing implements and contains a dry mount press, equipment necessary for making overhead transparencies, a light table, a primary typewriter, slide sorters, a bulk degausser, and a film repair station.

Two super 8mm movie cameras contribute capability for production of super 8mm films. Included are a silent Canon 518 model and Kodak XL sound system model. A sound recording booth contains a variety of recording equipment including a high speed duplicator for making multiple copies of audio cassettes.

Providing services within a reasonable time frame encourages faculty to use them and is reflected in the continuing increased use of media in the classroom as well as in the Learning Resource Lab. Knowledge of results of one's efforts is another important factor in continued involvement on the part of faculty. Built into the Learning Lab structure is an ongoing system for collecting data regarding utilization. The Director assumes responsibility for collecting, collating, and making data available to faculty. The system which is used involves a sign-in card for each student in the school and necessitates simply checking off certain items. Analysis of data cards at the end of each academic year yields answers to questions such as:

1. How much do students utilize the College Learning Center, i.e., number of hours per quarter?
2. What lesson titles are used by students and what is the extent of use?
3. Do students use the Center only for required, faculty assigned titles?
4. Which titles (content areas) reflect the highest degree of use? Lowest? Non-use?
5. Is there a discernible pattern to lesson title use which may reflect learning domains, e.g., cognitive, psychomotor, affective?
6. What is the utilization pattern for student levels - sophomore, junior, senior, graduate?
7. Do the utilization patterns reflect curricular intent?

While the preparation of present faculty regarding the use of learning centers is a priority item, we in nursing need to look to the future. What are we doing now in our programs, i.e., teaching-learning classes and practice, to insure that future faculty will also be aware of the importance of learning centers? The learning center approach is an accepted fact of life in most schools. Curriculum revision in graduate programs should include revamping of courses purporting to prepare the future teachers of nursing. And while knowledge of content, indeed, is important, so equally is the process of

presenting it. The College of Nursing, University of Utah, has recently revised the teaching practicum for graduate students and has included as specific learning experiences instruction and practice in the school's learning center. The practicum students function as teachers along with both the Director and faculty assigned to the lab. Thus the graduate students are provided with a teaching as well as an administrative view of the operation.

In conclusion, it appears quite obvious that increased and effective use of mediated materials and facilities will occur only when faculty become more knowledgeable in their use. Administrative support and commitment, curricular planning, increased knowledge of the teaching-learning process, planned programs for faculty development, easy access to service, and on-going study of one's own situation are areas to be considered and developed if schools of nursing are seriously interested in increased involvement of faculty in Learning Centers.

REFERENCES

Carbol, K. L. Utilization patterns of mediated instruction in the college of nursing. Unpublished manuscript, University of Utah, 1977.

Evans, L. B. The uses of instruction technology at the university of utah. Unpublished manuscript, University of Utah, 1958-1969.

Hadlock, A. P. An historical study of the services of the university extension division. Unpublished master's thesis, University of Utah, 1950.

Hipps, O. S. Faculty development: not just a bandwagon. Nursing Outlook, 1978, 26, 692-696.

A TALE OF TWO BUILDINGS

Laura Dustan, R.N., Ed.D.
Intercollegiate Center for Nursing Education
Spokane, Washington

Within a span of fifteen years I have had the unique opportunity of participating in the design of two new buildings devoted to nursing education. Each building is a reflection of program size, program types, and the teaching strategies required by the nursing curriculum(s) as perceived by two separate faculties.

The participation in the production of these new structures has left me with a sense of kinship with "The Chambered Nautilus". You remember Oliver Wendell Holmes' lovely lines:

> Build thee more stately mansions, O my soul,
> As the swift seasons roll!
> Leave thy low-vaulted past!
> Let each new temple, nobler than the last,
> Shut thee from heaven with a dome more vast,
> Till thou at length art free,
> Leaving thine outgrown shell by life's unresting sea!
> (Bartlett, 1968).

During these fifteen years I have had the opportunity to be involved with the determination of function and subsequent design of the College of Nursing building at the University of Iowa and with the new facility presently being constructed to house the nursing education programs offered by and planned for the Intercollegiate Center for Nursing Education in Spokane, Washington (subsequently referred to as the Center or the I.C.N.E.). I believe those of you who have seen the University of Iowa building will agree that it is a "stately mansion". The building which is under construction to house the programs of the I.C.N.E. will also be "stately" in appearance. However, it will house far more sophisticated teaching/learning resources than were built into the original design of the Iowa building. With the completion of the Spokane building I shall "rest my case" and will free my soul from the complexities of building financing and building design to meet the perceived needs of faculties, and the inevitable adjustment to a new environment which never is the perfect educational setting which the faculty dreamed it would be.

To give you a brief comparison between my two "mansions", the Iowa City building encompasses 76,000 gross square feet and cost approximately 2.8 million dollars to build in two years starting in 1969 and ending in 1971. In contrast, the Spokane building will have just under 60,000 gross square feet of space. Yet the price tag on the latter when it is finished in 1980 will be nearly twice the amount it cost to build the larger Iowa building approximately ten years earlier. The doubling in price is not just a consequence of the inflationary spiral which is a fact of life for all of us. Some of the price differential can be traced directly to the interior design of these two unequal sized structures.

The Iowa building reflected the requirements for nursing education as perceived in the late 1960's. The Spokane building is a demonstration of the developments in mediated instructional methods; an emphasis on self-paced, guided learning techniques; and a return to the belief that the laboratory should protect the patient from the first fumblings of beginning students.

These developments are now perceived by faculties as necessary adjuncts to the teaching/learning process. As such, they have become requirements which must be planned for and built into new buildings whose function is to provide a modern setting for nursing education.

It is important for us to keep the concept of changed perception of teaching strategies before us at all times as we consider and discuss the topic of the conference: "Learning Resources Centers: A New Challenge for Nursing Education". When I first studied nursing, the Nursing Arts Laboratory was in. Over the intervening years that type of laboratory was supplanted by the notion of no laboratory at all. The philosophy of the Nursing Arts Laboratory was replaced by the belief that direct involvement with the unsuspecting patient was the way to go in order to place the learning of techniques in a reality oriented context. Now we have swung all the way back to an ever deeper commitment to a laboratory setting for student learning. However, this swing back has been financially incremental. The cost of the Nursing Arts Laboratory was confined to the purchase of beds and a modicum of patient care equipment, provision of space for the efficient utilization of this sickness-oriented paraphernalia, and the salaries of the faculty who had the teaching responsibility for the course in Nursing Arts. As a dean and, therefore, a budget manager, I sometimes look back with envy on that era of demonstration and return demonstration. In retrospect, it appears to have been a relatively inexpensive and effective system for teaching nursing care procedures. With the cyclic nature of life's continuum one cannot help wondering when the demonstration/return demonstration method of teaching will be rediscovered!

But I digress from my assigned topic which is to examine some of the costs of present day Learning Resources Centers and how these Centers affect the budget of a nursing education program. However, before dealing with these specifics of money, I would like to make the subject matter more interesting by casting it into the framework of "A Tale of Two Buildings".

When I went to the University of Iowa in 1964 to become Dean of the College of Nursing, the first Nurse Training Act had just been passed. Those of you old enough to remember will recall that this legislation was the first to earmark federal money for the construction of new "nurse training" facilities.

Prior to accepting the appointment at the University of Iowa, I had travelled extensively around the country as a consultant in nursing education for the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing. On nearly every college or university campus I visited, I found the nursing education program housed in a converted dormitory, or in some abandoned section of an old science hall, or on the back side of the campus in drafty temporary buildings. It didn't take long to get the picture that nursing education programs on university campuses were drastically in need of a massive face lifting, and face saving, effort. The Nurse Training Act of 1964 proved to be the necessary catalyst to trigger a construction boom for nursing education that became the envy of many other disciplines.

At the University of Iowa in September of 1964, we had a new President, a new Vice President, and a new Dean of the College of Nursing. It was logical for the new President to call upon the various deans to work with the faculties to develop short and long range goals for their units. During the first months of the 1964-65 academic year, the College of Nursing's program plans were projected. It was immediately obvious that the developments planned for the College could never be accommodated in the one end of the old Nurses' Residence to which it had been assigned.

With the concurrence of the President, a Building Committee was appointed to set in motion the development of plans for a new building. The design of

the new facility not only was expected to take into account the various programs and numbers of students projected for the future, but also it was to accommodate the teaching strategies in use and envisioned. The original time table anticipated the procurement of funding and the development of the working drawings within three years and a construction phase of two years.

I will not bore you with the details of the struggle to obtain funding. Suffice it to say that the first phase took five years instead of the three originally expected. We had no difficulty obtaining a federal construction grant but the matching local money eluded us. It seems our project was in competition for state funds with the College of Veterinary Medicine at Iowa State University! Need I say more? A short editorial about our predicament appeared in the local paper, entitled "Hogs Before People".

The teaching methods the building was designed to accommodate were quite traditional. Autotutorial methodologies were not well developed for use in nursing education at that time. We had some faculty members who were interested in developing independent study resources but there was no one on the faculty who was an authority on such teaching strategies. We sent a small delegation to visit a program in a nearby state which was reported to be using futuristic methods. This contact was too brief and superficial to have any lasting effect on our planning. So we ended up with laboratory space, carrel space, TV studio space, and conduits. Our intent was to provide a building for the College of Nursing which could be adapted to changes in teaching methods rather than freezing our design to specific "hardware" and "software" which we were not adept at using and to which the faculty had not made a philosophical commitment.

I believe the way a building is designed must be reflective of the faculty's way of teaching. Over time, teaching methods will change but a new building had better at least fit the faculty members who will move into it. The Iowa building was quite responsive to the instructional system being utilized at the time of completion. It has since been extensively adapted to adjust to different teaching strategies. The important thing to note is that we did not spend large sums of money purchasing equipment we did not know how to use. That equipment has since been purchased, has been installed, and is being used very effectively, I understand. This deferred purchase of expensive equipment was advantageous to the College. With the tight budget we had for the building, we could put our money into the provision of space to accommodate growth. Funds from other sources could later be utilized to fill that space with equipment the faculty was then ready and eager to use.

Now, if I may, I am going to move you approximately 1500 miles from Iowa City, Iowa, to Spokane, Washington. Not only is this a long distance in miles but eleven years have passed. The critical factor here is not the change in location but, rather, it is the lapse of time between the beginning of two deanships.

The Intercollegiate Center for Nursing Education is housed in an old building that started out as a Carnegie Library in 1904. It is a remarkable building with the high ceilings of that era, enormous fireplaces (now blocked up), almost no toilets at all, and one ancient elevator that I am too timid to use for fear I will get stuck in it for the rest of my life. As the Center's programs have grown since its establishment in 1968-69, it has been necessary to find and lease space in two other rather ancient buildings which are within walking distance of the main building.

When I accepted the position of Dean, I understood that the very obvious space problem had been solved by the projected purchase of an old "academy" building. While extensive renovation would be required to adapt the structure

to the needs of nursing education, plans had already been started to effect this conversion. However, by the time I arrived on the scene the beginning of September, 1975, the plans to purchase that old building had already been scuttled. The National Council on Nurse Training had rejected the Center's application for federal funds to assist with the project and, instead, had urged the Center's four institutional sponsors to construct an entirely new building which would be designed to meet the specifications of present and projected programs.

Perhaps you can imagine my feelings of shock and incredulity to learn that there was a second new building experience in store for me! I confess to you that I felt as though some mighty force was saying, "Yes, you are an exception. Most people have to do only one doctoral dissertation but, because of your experience with one, we expect two of you."

So, once again, short and long range goals had to be developed. There were no such projections in existence to serve as guidelines for projecting the space and equipment needs that would be required for the Center's programs: those in existence and those needed for the future. Once the projections were established and accepted by the faculty and the Council of Vice Presidents, the policy making body for the Center, a Building Committee was appointed by the President to convert program plans to space requirements and the functional specifications required to accommodate the teaching strategies already in use or projected for further development and refinement by the faculty. One of the most exciting, rewarding, and exhausting experiences a dean can have is to be a peer member of a Building Committee. At the Center, I have been a proud participant in a Committee made up of talented, determined, and tenacious faculty members who have too long been deprived of functional offices and efficient laboratories to carry out their teaching and research responsibilities. Such a group is a force to be reckoned with, as our central administrators learned very quickly.

Again we had almost insurmountable funding problems. This time state funds were procurable but the federal construction funds had dried up just as we had finished the development of our grant application. To make a long ~~struggle seem shorter, I will simply say that we had good friends in Congress~~ and, because of that, we were the only school in the country that was awarded federal funds for construction of a nursing education facility in 1978.

One decade after beginning my first experience with planning space for teaching/learning purposes, I found that the so-called "futuristic methods" of ten years ago had become commonplace. Nursing Arts Laboratories were, indeed, a thing of the past. In fact, for a little while I wasn't sure the teaching trio--teacher and student at the two ends of a log--hadn't faded from the instructional scene during the three and one-half years I held a service position with the New York State Department of Health! To my relief, I found that not only did the teaching trio still exist but that the new "Learning Resources Centers" were expected to make possible more time for student/teacher interaction on a one-to-one basis (Poshek, 1972). I also found at the I.C.N.E. a faculty which was already committed to the concepts of independent study and self-paced learning opportunities for students.

To support these teaching strategies, funds had been diverted from other uses to renovate space in the old Library Building for the necessary laboratories. Materials to furnish the laboratories had been borrowed, begged, and procured by every means possible. When I arrived, two laboratories had been created "out of whole cloth", so to speak. One was called the Audio-Visual Laboratory and the other the Practice Laboratory. During that year, the laboratories were combined into the Independent Study Unit and were placed

under the administrative direction of a Coordinator who reported directly to the Dean.

As plans for the new building progressed, it was more and more apparent that the focal point for this educational facility was going to be the Independent Study Unit or, as renamed, the Learning Resource Unit ((Ray and Clark, 1977). To give a sense of the importance attached to the Learning Resource Unit, I will quote a few paragraphs from the federal grant application.

> The larger and improved facilities for the learning resources centers will enhance the opportunities for students to utilize their time more efficiently and effectively for independent study. The close proximity of the Independent Study Unit (comprised of the audio-visual complex, the TV complex, and the practice laboratory complex) and the library will allow students to read, view necessary media, and practice without losing time traversing the entire building.
>
> In the practice laboratory, provisions are made for two fully equipped units, one adult and one pediatric, plus facilities for other adult, nursery, and emergency units. (Fully equipped refers to those with oxygen, suction, sinks, and instructional television.) The variety of units will facilitate simulation of real situations and provide breadth of practice opportunities. The capability of partitioning the laboratory will allow testing to occur without closing the entire area. TV and video tape capabilities will enhance opportunities for immediate practice and/or feedback following viewing or practicing a specific skill.
>
> The audio-visual laboratory will provide carrels for individual and small group study. This approach was chosen for two reasons. It implements the objectives for collaboration with others, utilization of resources including peers, and individual responsibility. It also provides a better utilization of the space available to accommodate a large student body.
>
> The TV capabilities will facilitate teaching in both classroom and Independent Study Unit. It will be possible to demonstrate procedures and techniques of patient care, evaluate student performance, teach teachers to teach, utilize video programs specific to nursing and allied health fields, and capitalize upon resources and programs from other educational sources ..... The complex will also allow faculty to continue to develop innovative teaching methods using up-to-date audio and video equipment (Intercollegiate Center for Nursing Education, 1977).

A second measure of the importance attached to this unit is the percentage of space allotted to it within the total building. To conduct the nursing programs, the Facilities Planning Unit of Washington State University (the coordinating institution for the I.C.N.E.) allowed 34,951 net square feet. The Learning Resources Unit has been assigned 8,047 net square feet or 23 percent of the usable space in the new building. By contrast, the Library has 14 percent, the classrooms occupy 15 percent, and the faculty offices use approximately 18 percent of the space.

When the decision is made to make various independent study and self-paced learning options available for faculty to incorporate into their teaching strategies, there must be general acceptance that a large capital outlay is required to equip these highly specialized laboratories. In our new

building, approximately 70 percent of the original budget for movable equipment was earmarked for the Learning Resources Unit. The actual cost of equipping this Unit will be at least $400,000.

At the University of Iowa, we built a large and "stately" mansion which was modestly furnished and equipped. Approximately ten years after the dedication of that building, another nursing education facility will be dedicated in Spokane, Washington. This second building, also "stately" but somewhat smaller, will cost approximately twice as much as the first building. Some of the extra cost can be accounted for by the provision of a sophisticated Learning Resources Unit which is expected to be functional by the time the building is occupied.

The two things the buildings have in common are that both were designed to house programs of nursing education and both schools of nursing had the same person as dean during the planning and construction phases of the new facilities. The main differentiating factors between the two are the faculty's knowledge of and commitment to the use of autotutorial techniques in the teaching/learning process and the enormous increase in autotutorial technology which has occurred in a ten-year period. Both buildings are a reflection of the beliefs and priorities of a specific faculty at a fixed point in time. The dean must be sensitive and responsive to faculty beliefs and priorities, and must provide the financial and other support services required by the instructional program if the unit in nursing is to function at its optimum level. The dean plays a vital role in the whole process but that role does not encompass the sole determination of what form the curriculum will take or how it will be taught.

All this about new buildings is of great interest to me because of my personal involvement in the process. However, my discussion so far has only touched lightly on the problems associated with the initiation of a Learning Resource Unit in already occupied space.

For a full description of how one school of nursing accomplished the beginnings of these new laboratories, I would refer you to an article by Gail Ray and Charlene Clark of the I.C.N.E. to which I referred earlier in the paper (Ray and Clark, 1977). To give a very brief accounting of this undertaking, the authors point out that the faculty of the I.C.N.E. chose to institute an organized independent study approach in the fall of 1974. No money had been budgeted for this development. To initiate the program, two large rooms had to be freed up, modest renovations had to be accomplished, and equipment had to be scrounged from whatever source could be imagined. The authors provide such a good description of the process which ensued after the decision was made to proceed that it would be repetitious to describe it here. When I arrived on the scene in the fall of 1975, the Audio-Visual and Practice Laboratories were going concerns. They formed the basis for the planning which will result in the highly sophisticated Learning Resources Unit in the new building, previously described.

It is wonderful to have the opportunity to work with faculty members who are innovative, creative, and determined. However, if you, as administrators, have the same good fortune which I enjoy, I warn you that these faculty types are expensive. I don't have figures on the initial cost of setting up the two laboratories but I can give you figures on cost increments. For example, the cost of salaries for what we called the Independent Study Unit for 1976-77 was $44,931. By the 1978-79 academic year this total had increased to $63,619. Software costs were $6,949 in 1976-77. In 1977-78 we spent $11,224 on software. Equipment expenditures soared from a total of $23,638 in 1976-77 to $50,330 the following year. I am not quoting the budgeted amounts for this

fiscal year because we pared the allotments to the minimum for budget submission purposes. Before the year is out, we will have to find money to augment the software budget but we will hold off on buying additional equipment because the new building is now assured.

CONCLUSION

Learning Resource Units or Centers are costly to initiate and to maintain whether they are included in the design of a new building or whether they are started in renovated space. If they are to be worth the money required to equip and run them, the faculty of the school of nursing must have a philosophical commitment to the use of the teaching/learning strategies they make possible. The dean or director who carries the administrative and budgetary responsibility for the unit in nursing will need to be sure that such faculty commitment exists before becoming accountable for the expenditure of the large amounts of money these centers consume.

My second "stately" mansion will be finished in 1980. That is the year my soul at last will be free. But will my conscience be as free as my soul? The question to be answered will be, "Over time, was the faculty's commitment to the use of the Learning Resources Unit great enough to justify the large monetary investment in equipment and personnel which I supported and fought for when the building was being designed?" There is no way to answer that question in this paper. Only time can let me know whether both conscience and soul can, together, be freed from my "outgrown shell".

References

Bartlett, J., Familiar quotations. Boston & Toronto: Brown and Company, 1968.

Poshek, N., Multimedia approaches to teaching and learning in a baccalaureate nursing program. Journal of Nursing Education, 1972, 11(12), 36-43.

Ray, G. J. and Clark, C. E., The creation and use of an autotutorial learning system in a baccalaureate program in nursing. The Journal, 1977, 4(6), 32-34 and 47-48.

Intercollegiate Center for Nursing Education, Grant application to construction grant program for schools of nursing, Unpublished manuscript, Intercollegiate Center for Nursing Education, 1977.

INTEGRATING THE LEARNING RESOURCES CENTER WITH THE CURRICULUM

Helen Zsohar, R.N., M.S.N.
Arizona State University

A Learning Resources Center must have some justification for it's existence and that justification comes from the curriculum itself. Faculty beliefs about the nature of learning; the functions, components, and processes of nursing practice; and purposes and objectives of a nursing program influence the scope and depth of the teaching-learning environment. Most nursing curricula emphasize the student's need to develop skills in critical thinking and problem solving as well as in the more traditional areas of clinical nursing practice. In any curriculum, learning experiences and methods of instruction should be selected so as to fulfill the purposes or objectives of the program. The learning experiences should also be sufficiently flexible to permit students to develop in accordance with their individual talents and needs. Opportunities should be provided for independent as well as individualized study. These philosophical beliefs about a nursing curriculum justified the existence of an LRC in a School of Nursing (College of Nursing, 1978).

In addition, expanding knowledge in the health care field and advancing technologies in education leave no alternative for nursing educators but to review their practices and make changes necessary for today's world. These just happen to be the inescapable facts of modern educational life (Heidgerken, 1965).

There is an educational saying that states it is easier to move a cemetery than to change an overall curriculum and the teaching methodologies within it. Often educational innovations take thirty years before there is widespread acceptance of them; however, educators can no longer take that much time to adapt to an innovation, as changes are occurring much too rapidly.

When a curriculum is designed, it is based on a philosophy. Similarly, a Learning Resources Center should be philosophically based and complement the implementation of a curriculum. Generally, a philosophy of a Learning Resources Center is based on the following beliefs:

1. Faculty have a responsibility to facilitate student learning through nontraditional methods.
2. Faculty freed from traditional classroom presentations will have more time to nurture interpersonal relationships with students.
3. The student must be actively involved in his/her own learning.
4. The goals and desired outcomes of learning are prerequisites to the design and utilization of any learning experience.
5. Learning experiences which incorporate opportunities for practice and feedback tend to be more beneficial to the student.
6. Students learn in a variety of ways. Presenting material in a varied format facilitates learning.
7. Students should be allowed some control over their learning experiences.

Ultimately, the extent to which a Learning Resources Center becomes an integral part of a curriculum depends on several factors. These include faculty commitment, administrative commitment, financial resources, budgetary constraints, time constraints, available physical facilities, and the characteristics of the learners who will use the environment.

Faculty commitment does not mean that every faculty member must be wedded to the notion of a Learning Resources Center. Instead, it means faculty as a

group must be supportive of a Center as a learning environment. The greater the faculty commitment, the greater will be the faculty demand for more experiences and services through the Center. Administrative commitment tends to both influence and be influenced by the level of faculty commitment. Administrative support for the concept of a Learning Resources Center is imperative--especially since the administration controls money and physical space, both of which are necessary for the effective operation of a Learning Resources Center. Initially the development of alternative instructional modes is costly in terms of faculty time; however, over the life of the instructional mode, the amount of time spent by faculty in the development of alternative experiences tends to be about the same as that which would be spent on repetitious presentation of the same material in a more traditional setting.

Today nursing educators are faced with providing learning opportunities for students from widely disparate backgrounds. Older people are returning to school to make nursing a second career; a greater number of students from educationally and socially disadvantaged backgrounds are pursuing careers in nursing; registered nurses are returning to school in increasing numbers; and a growing number of men are entering nursing which has traditionally been viewed as a woman's world. Each of these groups brings diverse abilities and styles of learning. The various learning modes available in a Learning Resources Center are especially applicable to educating students with diverse backgrounds.

One of the problems facing nursing educators is that of providing adequate learning experiences for students. Comments are frequently made by faculty members to the effect that there are just too many students, there is too much to teach, and adequate clinical experiences are limited. Faculty find it impossible to provide every experience for every student. Clinical agencies are overloaded with students seeking the same types of experiences. Opportunities for students to practice in certain settings and with certain types of patients are limited. The curricular need to provide students with some uniformity of experience and the increasing difficulty faculty members encounter in providing students with "real life" experiences, support the need for vicarious learning experiences which simulate reality. These types of learning experiences can be provided in a Learning Resources Center.

When vicarious learning experiences are provided in an LRC, one problem that must be addressed is the effectiveness of the transfer of learning from the vicarious experience to the real one. Travers (1972) reports that there are considerable data to support the viewpoint that:

> The (pupil) should have experience with a wide range of problems that differ somewhat from one another. This provides experience in dealing with the slightly unusual, and develops an expectation that each problem will have to be solved in a way that is somewhat different from that used in the solution of previous problems. In a sense, this may be called training for flexibility. (p. 182)

He further points out that once a principle has been learned, then the student should learn how to apply it to other circumstances which contain many distracting and irrelevant elements.

> Unless he does this, he may have difficulty in learning to discriminate between the relevant and irrelevant features of situations and may not see the applicability of a principle simply because he is distracted by an overwhelming mass of trivial detail. (p. 183).

It is generally agreed among administrators and faculty that the solution to the problem of transfer of learning from vicarious learning experiences is to develop multiple simulated experiences so that the student will have opportunities to apply the knowledge to as broad a variety of circumstances as possible.

Another problem which may be solved, at least in part, by the services of a Learning Resources Center is the problem that many beginning nurse educators don't know how to teach. Because of the current emphasis in many master's programs on clinical speciality, the master's graduate is prepared almost exclusively as an expert clinical practitioner. However, this possession of specific nursing knowledges and skills does not insure that the graduate has the ability to teach others. The neophyte teacher needs help in learning to employ varying teaching strategies and to maximize his/her particular potentials as a teacher. A Learning Resource Center which is dedicated to innovative implementation of the learning process can provide an excellent practice arena for the person who is learning how to teach.

Another educational problem is that many teachers are under the impression that the teacher, rather than the student, is responsible for learning. Postman and Weingartner (1969) in their book Teaching as a Subversive Activity point out that:

> There can be no significant innovation in education that does not have at its center the attitudes of teachers, and it is an illusion to think otherwise. The beliefs, feelings, and assumptions of teachers are the air of a learning environment; they determine the quality of life within it. When the air is polluted, the student is poisoned, unless, of course, he holds his breath. (Not breathing is widely used by students as a defense against intellectual poison, but it mostly results, as you can imagine, in suicide by suffocation.) (p. 33,34)

Inherent in the successful integration of a Learning Resources Center with the curriculum is an understanding by the faculty that the scope and depth of student learning tend to decrease in a teacher controlled environment. Heidgerken (1965) supports the notion that:

> . . .no one method is in and of itself intrinsically better than another; its effectiveness is relative, that is to say, each method varies in its effectiveness in relation to the desired objectives, the nature of the course, the learner's level and the teacher.
>
> Some general principles which may be used as guides in the selection and the use of teaching methods include: methods should be suited to the objectives and the content of the course; methods should be adapted to the capacity of the student; methods should be in accord with sound psychological principles; methods should suit the teacher personally and capitalize on her special assets and methods should be used creatively. (p. 445)

It is imperative that nursing educators be willing to explore alternative nontraditional methods of teaching and learning and to focus on creating climates for learning rather than on the dissemination of information.

The long range effects of learning in a nontraditional environment, hopefully, will be seen after the student graduates. Rheba DeTornyay points out that:

> . . .if one of the major goals of education is to help the student develop the ability to continue learning after her formal education is complete, it seems important that she should have supervised experience in learning independently. (p. 102)

Thus, there is a need to employ the use of guided but independent learning experiences while the student is in school to increase the likelihood that the student will become a more self-directed learner after graduation.

Another problem that can be resolved in part by the use of a Learning Resources Center is that of assessment of student learning. Inasmuch as nursing educators encounter difficulties when trying to provide every student with the essential clinical experiences, faculty also have the problem of evaluating a student's clinical skills. Simulated environments are being used increasingly to aid with the assessment of clinical skills; however, there are both advantages and disadvantages to this strategy.

One of the advantages of using a simulated environment for evaluation purposes is that it is easier to control the extraneous environmental variables than it is in the "real life" environment. In the simulated environment, the student is better able to concentrate on the demonstration of specific performance objectives and the teacher is better able to measure the degree to which the objectives are being attained. Also, under these circumstances, there tends to be less pressure on the student to perform because the consequences of an error are not "life-threatening" as they may be in a clinical setting. On the negative side, however, the students may not take a simulated experience seriously. If the task is performed incorrectly, then the results of this learning experience may only be reflected in a failing grade rather than as an internalization of the seriousness and consequences of the error itself.

Use of a simulated environment for purposes of assessing student performance may also cause the students to develop negative attitudes toward the experience, especially if they feel they are going to be watched and graded. Simulated experiences can be used for purposes of providing practice, enrichment, assessment, or remediation experiences. Under all circumstances, however, the student and faculty should clearly understand what the specific purpose of the simulated experience is and what the expected outcomes are. If the students are to be evaluated in a simulated situation, then, in fairness, they should be given the opportunity to practice in that environment prior to the final evaluation.

One of the criticisms about the use of a Learning Resources Center is that it decreases the amount of time faculty spend with students. This is not necessarily true. What the LRC does do is to change the nature of the teacher-student contact. The LRC, by virtue of the types of learning experiences provided therein, can free the teacher from repetitious teaching and permit the teacher to function in the nontraditional role of diagnostician, motivator, interpretor, and resource person instead of the traditional role of disseminator of information.

From a learner's viewpoint, one of the hazards of a Learning Resources Center, and one that needs to be monitored closely, is that the activities in the center become additional things to be learned rather than alternative ways of learning. Teachers sometimes operate under the assumption that if the students are released from the traditional type of class commitment, then the teacher has a right to fill that space with another activity. Thus, the students soon begin to view their participation in the Learning Resources Center as a "piling on" of work rather than an activity that enhances their

learning. This use of an LRC should be avoided if the LRC is to become an integral, respected part of the curriculum.

REFERENCES

College of Nursing. Self-evaluation report. Unpublished manuscript, Arizona State University, 1978.

DeTornyay, R. Strategies for teaching nursing. New York: John Wiley and Sons, Inc., 1971.

Eble, K. E. The craft of teaching. San Francisco: Jossey-Bass Publishers, 1977.

Heidgerken, L. E. Teaching and learning in schools of nursing. Philadelphia: J. B. Lippincott Company, 1965.

Instructional innovations: ideals, issues, impediments. (Pub. 16-1687) New York: Dell Publishing Company, 1969.

Postman, N., & Weingartner, C. Teaching as a subversive activity. New York: Dell Publishing Company, 1969.

Russell, J. D. Modular instruction. A guide to the design, selection, utilization, and evaluation of modular materials. Minneapolis: Burgess Publishing Company, 1974.

Schweer, J. E., & Gibbie, K. M. Creative teaching in clinical nursing. St. Louis: The C. V. Mosby Company, 1976.

Siegel, L. (Ed.) Instruction: some contemporary viewpoints. San Francisco: Chandler Publishing Company, 1967.

Travers, R. M. Essentials of learning (3rd ed.). New York: The MacMillan Company, 1972.

MANAGING AND OPERATING A LEARNING RESOURCE CENTER FOR NURSING

Jo Ann Crow, Ph.D.
University of Texas at San Antonio

A Learning Resource Center has just been established in your school of nursing and you have been named the person who is responsible for its management and operation--the Manager, Director, Coordinator, Department Chairman, or whatever title your school decides to use. What happens next? Often what happens is that materials are gathered together in the allotted space, the doors open, and the LRC begins to provide service to the students and faculty, letting the organization and management of the LRC develop on a day-to-day basis. As the requests for services increase, so do the frustrations of the manager of the LRC. Many of these frustrations can be eliminated, and more efficient and effective servicing of the requests can be gained, by keeping the doors of the LRC closed for a day or two until a plan for operating the center has been prepared.

Systematic planning is the key to successful operation of an LRC. A systematic plan is just a part of the overall systematic process that is required in operating an LRC which involves assessment, planning, implementation, and evaluation--steps not unlike many of the processes taught in nursing curricula for achieving effective patient care.

ASSESSMENT

The first step, assessment, involves taking a look at what the LRC is all about, specifically the goals and objectives of the LRC and the resources available to carry out these objectives. The goals and objectives of the LRC should be examined in relation to the school's curricula. When the objectives are analyzed, the present program and size of student body as well as the program offerings and enrollment for the next four or five years should be considered. The activities that will need to be done to achieve the objectives should be clearly identified in writing. If one of the objectives is to furnish a library type of service, it means certain printed materials, software, display areas, and circulation procedures will be needed. If the nursing skills laboratory is to be part of the LRC, then it means ordering clinical supplies, obtaining practice space, setting up equipment, and stocking and restocking items. Identification of what is needed can be facilitated by making a list, such as illustrated in Figure 6, of each separate LRC function; and then identifying the desired practice space, personnel, equipment, software, and supplies they will require.

	LRC Functions			
	Library	Nursing Skills Lab	Independent Study	AV Service
Space				
Personnel				
Equipment				
Software				
Supplies				

Figure 6

Once there is an overall view of what is to be done and what is required to do it, one must assess what is on hand in terms of facilities and resources. The space that has been allotted should be examined to see how it will function in terms of the objectives. If one of the objectives indicates a need for individualized study space and there is no space in which to put a carrel in a reasonably quiet environment, then a solution to this problem will need to be worked out. When assessing the available space, be sure to note not only the floor space and area size, but also what areas of it may be noisy due to air conditioning and heating equipment. Entry and access patterns, as well as bright and dim areas of lighting, should be identified and considered in planning for space utilization. The kind and amount of storage space that will be needed for such things as equipment, software, models, and nursing skills supplies should also be considered. All of these factors will provide data for making decisions about how to arrange the facilities to provide the most efficient use of the space.

Next, the resources should be assessed. Resources include hardware such as audiovisual equipment, nursing equipment and supplies, study carrels, software (such as books, films, or self-instructional learning packages), models, mannequins, tools, and any other equipment that may be available. Every item needs to be inventoried in such a way that it is easy to make judgments about how the item meets the objectives of the LRC. The inventory list will also help the LRC personnel keep abreast of what is available. In fact, many schools require a yearly inventory check on all supplies and equipment. Notations made on the inventory list about where each item is stored or located will expedite subsequent inventory checks.

Personnel need to be assessed in terms of both what they have been hired to do and what other abilities they possess. For instance, a person hired to fulfill a position as an AV equipment technician may also have abilities to do other specialized things such as designing forms for equipment requests. I personally believe in creating a team approach to the management and operation of the LRC in which people are hired to perform certain job responsibilities, but all of the personnel work together to achieve the goals of the center. Thus, the knowledge and skills of the center's personnel may overlap in performing the work necessary to run the center. Their ideas and suggestions are extremely important in deciding how the center can best be operated.

Faculty needs must be assessed to determine how they will use the center as part of the curriculum and their teaching strategies. Will they hold any classes or seminars in the LRC? How will they expect their AV requests to be serviced? Are any AV materials to be produced by the center for faculty use?

Assessing student needs involves looking at curriculum objectives which must be met in the LRC, as well as requests made by students relating to AV equipment and materials, study space, or the nursing skills practice area. Consideration should also be given to assessing students' needs for remediation and for developing certain basic skills. Because each LRC must be planned within the context of its own situation, there may be other areas in relation to each individual LRC that need to be considered in the assessment phase of the planning process such as the availability of campus-wide library and AV services. However, once all of these areas have been assessed, one should have a good picture of what the center is expected to do, what is available, and what is needed.

PLANNING

With the assessment data clearly in mind, specific plans for managing and operating the LRC can be made. The planning phase involves making decisions about the who, when, what, why, how, and where of the activities of the center.

First, policies concerning who can use the center, and when, must be formulated and made available to administrators, faculty, and students. Will the resources of the center be available only to nursing students, or may they be used by other students in the institution or by nurses in the community? At first these may seem like very simple matters which don't need to be written down, but as the center grows and people become aware of the facilities and resources, the demand for use by people outside the school may create a problem. For example, if nurses in the community are allowed to check out the films and videotapes for use in in-service programs, how will this affect the needs of nursing students to have the materials available for study? If you have models in the center (such as resuscitation models) which are used in teaching nursing skills, will other students (such as medical students) be allowed to use them? When equipment or software is used by faculty or students and is broken or damaged, who is to pay for repair or replacement? Will students be allowed to use equipment outside the school and for what purposes? These are only a few of the questions pertaining to LRC activities about which policies need to be formulated and made available in written form to administrators, faculty, and students. Copies of the policies should be available to others, such as nurses, in the community when requested.

Having policies established and written helps solve problems before they arise. Saying "no" to a request for equipment or software is much easier when it is seen as an established school policy rather than the personal judgment of the LRC director. When establishing policies, input should be obtained from administration, faculty, and students so that the policies clearly reflect the wishes of the people involved, as well as any constraints which may be inherent in the policies of the parent institution. The policies will probably change as the LRC grows. This will usually be necessary in order to respond to new or increased LRC services.

Once overall policies have been set, procedures for running the center must be established. Circulation procedures for equipment and/or software should include forms to show who has the equipment or software, when it will be returned, what happens if it is not returned on time, and who is responsible for loss or damage. Often a form will go with the equipment to show that the person has permission to take the equipment away from school. All LRC equipment must be clearly labeled. It is very important that nursing equipment such as stethoscopes, blood pressure cuffs, or oto-ophthalmoscopes be clearly labeled, especially if students or faculty are permitted to take them to hospitals or places where there may be some question as to who owns the equipment.

Other procedures which must be clearly worked out and available in written form include:

1. Equipment set-ups for faculty and students. Who will set up projectors? Who will run them?
2. Circulation of materials within the LRC. How are self-instructional packages to be used in a study carrel? How does one preview film within the LRC?
3. Provision for learning and practicing nursing skills if the nursing skills area is a part of the center. Is the skills area organized

around self-instructional units, small group instruction with clinical instructors, or classes held in the LRC? Who decides what supplies are needed, how and when supplies will be ordered, how they can be checked out? Who is responsible for assembling equipment and cleaning it after use?

Stating a procedure for cleaning equipment may seem like an insignificant task unless you are the one who ends up repackaging bandages, refilling IV bottles, or cleaning catheter trays during the weekend football game. If students need to be checked off as they perform nursing skills, procedures for who will do this, when there will be someone available to do it, and how this will be reported to the instructor must be stated specifically.

A third major area in planning, and one closely allied with procedures, involves record keeping. This again can be examined according to each of the major areas of function in the LRC. The importance of good record keeping becomes most apparent when one begins to collect data that will be used for making decisions about budgeting, new equipment, software, renovation of space, and personnel requirements and utilization. The kind of records kept or data collected may vary with the various functions of the center, but all areas of the LRC should keep data on who uses the area, in what ways, how much they use it, what supplies or equipment are involved, what personnel are involved, and the cost of the supplies or equipment utilized. Record keeping should not be so complex that it involves a great deal of time on the part of personnel. Simple forms for recording information will usually suffice. A form which is used at our school for recording all equipment check-outs is shown in figure 7. This form is simple and yet thorough in that it shows who, when, where, and what. At the end of the month, how many faculty or students requested AV equipment for use in the classrooms or clinical areas can be quickly tabulated. By comparing the number of equipment requests received with the number of requests fulfilled, the extent to which the LRC could and could not fill requests is documented and can be used to justify the need to purchase or store certain pieces of equipment. Again, as an example, for our nursing skills labs we have developed a profile sheet for each lab session which shows the primary objectives of the class, how the laboratory area is set up, what equipment and software are needed, what supplies are used, their total cost, and the cost per student.

Cataloging software is another large area of record keeping. Some system must be devised that allows the LRC user to find out what is available, where to locate it, and how to use it. When establishing a cataloging system, a decision must be made regarding whether or not to use an established system, perhaps one compatible with other libraries in the institution, or to design an individualized one. Whichever system is chosen, it must be coordinated with the curriculum, and it must allow for growth. It is desirable to have a card catalog system in which the materials are listed and cross-referenced by categories that correlate with areas of the nursing program. This makes it easy for faculty and students to utilize the available resources efficiently. The card catalog system should be so designed that any LRC user can look up a topic and determine all materials (print, film, audio, visual) that are available in the LRC on that subject.

When devising a cataloging system it is necessary to determine who will do the "chores" related to cataloging (such as making out cards, marking materials, deciding what categories to use, and sending information to faculty and/or students about their arrival). These procedures are small tasks when one item is involved, but when the LRC receives several books or films at one time these tasks can be very time-consuming. If use of materials is delayed

University of Texas School of Nursing at San Antonio, Texas

CLASSROOM SERVICE REQUESTS

DAY / MONTH / DATE

TIME OF DAY	REQUEST NUMBER(S)	PROJECTORS				MICRO-PHONES		VIDED TAPE PLAY-BACK	AUDIO RECORDER	OTHER SERVICES	LOCATION
		16 mm	35 mm SLIDE	DUKANE	OVERHEAD	STAND	LAVA-LIER				
AM											
PM											

Figure 7. - Classroom service requests.

because procedures for cataloging are not easily accomplished, then the center will not be able to maximize use of its resources.

The planning for an LRC also includes budgeting. This usually means planning how to get money and planning how to spend it. Budgeting for an LRC includes not only the need to consider requests for resources and materials, but also the need to allocate the resources and materials throughout the year. Planning a budget to get money involves looking at past performance, present operation, and future needs in all areas in which the LRC functions or plans to function.

Data from records that have been kept become crucial information in substantiating requests for monies. From my experience in the LRC, requests for monies which are based on specific facts and figures and related to the goals and objectives of the center are usually granted. Requests based on desires, wants, or nice to have's are often turned down, and in times of economic cutbacks, may not even be considered. One example of where facts and figures are needed to support a budget request is in the area of supplies for nursing skills learning experiences. Too often LRC personnel plan to get this equipment by using hospital left-overs, pharmaceutical hand-outs, or out-dated equipment. If nursing skills are an essential aspect of nursing education, and supplies and materials are needed to carry out objectives of the program related to this, then (I believe) budget requests should include these items. The request should be for a line item that is specifically allocated to the LRC for this purpose. Then monies can be allocated to support this part of the program on a regular basis.

By keeping careful records and obtaining data on the cost of supplies necessary to teach students the nursing skills deemed essential in our program at the University of Texas Health Science Center, School of Nursing, we have been able to get funds allocated specifically for this part of our program. The support data submitted with the budget requests include the kinds of skills that are taught and the cost per student of the supplies used. The data allow for reusing certain types of materials when possible and for a maximum number of students using the same supplies (see figure 8). Thus, the budget request reflects the actual need for money to run the skills classes rather than the ideal. Being part of a health science center in which medical and dental schools also request certain supplies and equipment for their programs helps make the School of Nursing administration more receptive to these kinds of budget requests. However, I believe lack of administrative support is often a result of our failure to submit data that justify a request in terms of carrying out the objectives of our program.

As previously mentioned, data from records of requests for servicing AV equipment, production of AV materials, equipment for continuing education programs, self-instructional programs, and print and AV materials, supply important information that can be used by the LRC director to formulate and substantiate budget requests. Requests for additional personnel and increased space allocation must also be backed up by specific data. In addition to information on LRC usage over the past one or two years, data describing present usage in terms of an average week or month can be used to further justify requests for monies. How many people use the center at peak times? How well are the services provided? What problems have arisen because of space or personnel limitations? Answers to these questions help the administrator explain the need for increases when the budget is presented to the regents or legislators.

Another major area in budgeting is planning for the future. To allow for rising costs, 20% is usually added to the existing budget. Although some

UNIVERSITY OF TEXAS SCHOOL OF NURSING LEARNING LAB EXPERIENCE

San Antonio, Texas

Supplies, equipment, software and cost sheet

Level_____ Time_____ Location_____

Date_____ Required Media_____

No. Students_____ _____

No. Instructors_____ Charts_____

Handouts and/or Forms_____

Proj. Quan.	ITEM	Quan. ret. to stock	Quan. Used	Unit Cost	Ext. Cost	NOTES

Total No. Students: Total Lab Cost: Cost Per Student:

Special Instructions:_____

LH/rev. 9/79;cjd

Figure 8. - Supplies, equipment, software, and cost sheet.

items may go down, most items increase in price, and this rise in cost must be planned for. To plan for the needs of new areas which may be added to the school's curriculum and the impact these changes may have on the LRC in terms of equipment, software, space, and so forth, curriculum input needs to be obtained from both administration and faculty. Instituting a program of self-instructional modules for an elective course in pediatric physical assessment may have many implications for the LRC in terms of the adequacies of the existing equipment, supplies, software, and space. Having to accommodate these requests after the budget is presented and monies are allocated can create a host of problems.

Once academic monies are awarded to a school, there are very few ways to obtain additional monies during that budget time period. This not only means is it necessary to plan the budget carefully to obtain the funds to carry out the goals and objectives of the LRC, but it also means careful budgeting of the monies once they are allocated. How monies for the LRC are allocated within the curriculum must be considered. Criteria for purchasing equipment and software must be established as well as some means of establishing priorities for purchase. A first-come first-served basis may not be the best system for building a well-rounded collection to meet the curriculum needs. In many schools, faculty committees are established which review the software requests, relate them to the total program needs, and approve or disapprove the requests. The director of the LRC should also plan a system for informing faculty of the new materials that are available as well as working with faculty to facilitate their use of AV materials in teaching. By doing this, all faculty have input into the software purchases.

The whole area of budgeting is extremely important to the operation of the LRC and one in which many people in academia have very little experience. One should not hesitate to seek out the advice and expertise of someone who is knowledgeable in this area when planning a first budget. Many hours of work can be saved by doing this. Also, getting budget advice will prove much more profitable in both money and time than trying to figure out the how and why's of budgeting by oneself. Once one has experienced the budgeting process, one can see more clearly what kinds of information are required to make up a budget and to spend the allocated funds. Ultimately this experience will highlight the need for developing and improving a system for collecting data.

IMPLEMENTATION

Implementing or operating the Learning Resource Center is, in my opinion, the most enjoyable part of the process of management and operation. Personnel who are involved in operating the center and who help to establish and maintain an atmosphere conducive to teaching and learning can do much to make the LRC an area which attracts faculty and students. The management and communication skills of the director of the center are key factors in the success of the center's operation. Well defined policies, simple procedures, excellent facilities, and an ample budget do not offset the adverse effect an inept director may have on the utilization of an LRC.

An LRC director's ability to communicate about the philosophy and purpose of the center will permeate both the center's personnel and the people using the center. My own philosophy is that the LRC and its personnel provide a service to its users and that the center's primary concern should be to enable faculty and students to use the center with a minimum of effort on their part and a maximum return on the time they spend in the center or in using its services outside the center. For example, if the faculty requests the use of

a 16mm projector and a film to be shown in a classroom, the LRC personnel can help ensure the effective use of media as part of a teaching strategy by setting up the projector and film, checking to see if it is running properly, and focusing the film before the instructor and class arrive and, if needed, staying to run the projector. Faculty who have to struggle with running projectors and feel uncomfortable in using them with a class will seldom use media. The director is also responsible for communicating to faculty and students what resources and services are available in the LRC and how the center's personnel can facilitate their use of the center.

Managing the center under a philosophy of service involves working with the LRC personnel to help them see themselves as a vital part of the center's functioning and as members of a team which works together to achieve the center's goals. A grouchy technician can be just as detrimental to the center's image as a grouchy director. Personnel should be given opportunities and encouraged to learn about the curriculum and various facets of the nursing school and the part the LRC plays in carrying out the school's programs. They should be given information on what areas of the curriculum have special needs and what kinds of activities students are involved in at various levels of the program which relate to the LRC. They should be encouraged to get to know faculty and the faculty members' particular likes and dislikes in regard to AV resources. At the same time, it is the responsibility of the director of the center to see that faculty and students know the personnel in the center, what their areas of responsibility are, the particular knowledge or skills the personnel have that they can share with faculty and students, and things the personnel should not be expected to do (such as open the center after hours). Good management allows for input from the personnel in regard to all aspects of the center and feedback from the director, faculty, and students about how the staff members are doing their jobs or functioning as part of the LRC team.

Good management of the LRC and good communication by its personnel usually result in an atmosphere favorable to teaching and learning, but one should also be aware of other factors which contribute to the overall environment. These may include noise in or out of the center, heat and cold regulation, attractive decor (even in old facilities, warm colors and inexpensive pictures can make an LRC more appealing), smoking regulations, traffic patterns, congested areas, and broken equipment. As director, it is important to spend some time each week, at various hours of the day and on different days, just observing the operation of the center and writing down what is observed. If something appears to be distracting; one should find out if it occurs regularly or just happens occasionally and then make plans about solving the problem.

Implementation is a blend of personnel and atmosphere that enhances the space and facilites of the LRC and invites faculty and students to make use of its resources. The philosophy and leadership style of the director are key elements in the success or failure of the center. Management and communication skills of this person set the tone in which other personnel will function and will create an atmosphere which affects the activities of the center.

EVALUATION

Evaluation is the fourth major step in a systematic process of managing and operating an LRC for nursing. Three areas in which feedback on the center and its activities are important are administration, faculty, and students. Both formal and informal evaluation should take place. Evaluation tools should be developed to assess the major functions of the center. These tools

should be used to collect data on a regular basis. When evaluation data are received in a systematic way, problem areas can be spotted early and means taken to correct the problem. On the other side, positive feedback on the services and activities can be shared with personnel to help them be aware of how users feel about the center and the value of their contributions. Evaluative feedback helps to make decisions about which services should be increased, which ones deleted, what policies to change, which procedures need improving, what new equipment is needed, and so forth. This feedback also indicates administration, faculty, and student support or nonsupport of the LRC.

Informal evaluation should also be made on a regular basis. The LRC director should take time to talk directly with faculty and students about the center, how they use it, and how they feel about it. Do they have a pleasant view of the center, a negative view, or no view? Answers to all of these questions provide LRC personnel with information that can be used to improve the center's services.

Finally, and most important, the center should be evaluated in relation to whether or not it is achieving the LRC goals and objectives. No matter how warm the atmosphere, if the center is not accomplishing the goals, some changes need to be made in its management and operation.

In summary, I believe the most efficient and effective way to achieve the goals and objectives of the LRC is through a process of management and operation that is undertaken in a systematic manner. This includes assessing the purpose and resources, planning how the center will operate, implementing the activities of the center, and evaluating its effectiveness. The process involves many parts and people that must be interwoven to provide a fabric that is appealing, pleasing, and wearable to all of its users. It is an interesting, exciting, frustrating, rewarding process to those personnel who are involved in weaving the elements together. It is an interesting, exciting, sometimes frustrating, and also rewarding experience for those who benefit from their labor: the faculty and students of your program. It is a vital part of any nursing school and I wish you all success in managing and operating your own LRC.

LEARNING RESOURCES CENTER'S EVALUATION: COST AND LEARNING EFFECTIVENESS

Jerrold E. Kemp, Ed.D.
San Jose State University

Consider the following situation:

The LRC has been serving your department for many years. The University has just been informed that next year's budget must be reduced by 10%. Your Dean believes the LRC is an expensive, unnecessary operation and should be replaced by more conventional classroom sessions.
WHAT DO YOU DO?

Nursing educators in colleges and universities have probably given more attention to innovating and revising their instructional programs than almost any other professional group. Much time and effort are expended in course and unit development to specify terminal and enabling objectives. Likewise, the selection and preparation of instructional resources are integral to the process and are essential to the LRC program. These two activities comprise the first and second elements of systematic instructional planning. The third element--evaluation--usually gets attention only in terms of the preparation of written and performance tests to measure student learning. Such a situaton as described above does indicate that other important outcomes, as part of the evaluation process, urgently deserve attention.

The types of questions that one should plan to answer in determining the value of and justification for an instructional program and the LRC activities that may be part of it are:

1. To what degree does the LRC assist students to accomplish unit (module) objectives?
2. How much does it cost to establish and operate the LRC?
3. How much does it cost per student to operate the LRC?
4. How much time do students spend in the LRC?
5. How much faculty, staff, and facilitator time is required in the LRC?
6. What is the ratio of faculty time to students or student time?
7. What reactions do students have to studying in the LRC?
8. What comments do faculty and staff have about the LRC?

*The information in the boxes was shown in visuals during the presentation.

With respect to seeking answers to these questions, five areas need attention. They are:

- Student learning and performance outcomes
- Program effectiveness and efficiency
- Program costs (total or per student)
- Student attitudes and opinions
- Instructors' and staff reactions

Let's examine each one.

STUDENT LEARNING AND PERFORMANCE OUTCOMES

The measurement of student learning is based on results of the written and performance tests that measure the attainment of unit or module objectives. Faculty are usually familiar with this procedure. But do they go to the next step?

The next step is to relate the test questions directly to stated objectives. Then an analysis of correct answers can show the objectives achieved by each student. Consider the following:

(a) Relationship of Unit Objectives to test questions

Unit Objectives	Test Questions
A	2, 4, 11
B	1, 7
C	3, 6, 12
D	8, 10
E	5, 9

(b) Student performance data

Student	Correct Answers to Questions											
	1	2	3	4	5	6	7	8	9	10	11	12
AJ	x	x	x	x		x	x	x	x	x		x
SF	x		x		x		x	x	x	x		x
TY	x	x	x	x	x	x	x	x	x	x	x	x
LM	x	x	x	x	x	x	x	x	x	x		x
RW	x	x		x	x	x	x	x	x	x	x	x
WB	x		x	x	x	x	x	x	x	x		x

(c) Objectives satisfied by each student

Student	Objectives Satisfied				
	A	B	C	D	E
AJ	x	x	x	x	
SF		x	x	x	x
TY	x	x	x	x	x
LM	x	x	x	x	x
RW	x	x	x	x	x
WB		x	x	x	x

Analysis of test items, through the campus computer services, can provide the information about student performance and the objectives that were satisfied, i.e., data about items b and c in the above example. This is a necessary first step to determining program effectiveness and efficiency.

PROGRAM EFFECTIVENESS AND EFFICIENCY

Effectiveness refers to the degree to which students accomplish unit or module objectives. The five students listed in the above example accomplished 90% of the objectives. This percentage is calculated by totalling the objectives satisfied (i.e., the x's in c) and dividing by 6, the number of students. Since the total number of objectives satisfied is 27, the average number of objectives accomplished is 4.5 per student. Based on the 5 objectives, an achievement of 4.5 means a learning effectiveness of 90%. Only rarely can you hope to reach the absolute standard of 100% where all students are accomplishing all objectives. Faculty should set acceptable student achievement levels for a program that they consider to be effective. If the results are not at a desired level, then revisions in instructions should be designed that can, with suitable student effort, change the levels of learning.

The effort, often measured in time required to achieve unit or course objectives, is a measure of efficiency. Two aspects of a program require attention here. One is the faculty and staff time required in the program and the other is the time required by students to reach satisfactory learning.

Individual faculty, staff, and aides' time, assigned to the LRC and spent in related activities (planning, marking papers, evaluating performance, preparing materials, and so forth), can be recorded. Then judgments can be made as to whether a fair amount, or an excessive amount, of time is being devoted to the program. This can permit an indication of efficiency from the instructional point of view.

Turning to the students, they can be asked to keep records of time spent on studying a unit or set of objectives. For example, a student who requires four hours to accomplish six objectives would have an efficiency index of .67 (time divided by number of objectives). This index can be calculated for each student and then for the entire class. Here again, one needs to make a judgment as to whether the efficiency index is acceptable or whether revision in materials and procedures may be required to lower the index; e.g., students taking three hours to accomplish six objectives for a 0.50 efficiency index.

PROGRAM COSTS

Costs fall into four categories:

- Initial installation costs
- Developmental costs
- Operating costs
- Indirect (overhead) costs

The following examples illustrate an application of these costs:

INSTALLATION COSTS

Renovating a Room	
Constructing carrels	$400
Electrical work	300
Equipment	
10 audio cassette players @ $80	800
10 Carousel slide projectors @ $160	1,600
3 video cassette players and monitors @ $1,000	3,000
TOTAL:	$6,100

DEVELOPMENTAL COSTS

Planning time:	
4 people (2 instructors, designer-media specialist, part time evaluator), 2 weeks summer @ $1,000 each...	$4,000
Staff time:	
Librarian, 1 week summer.....	375
Graphic artist/photographer, 120 hours @ $8.....	960
Secretary, 2 weeks @ $150.....	300
Student assistants, 100 hours @ $3.00.....	300
	$1,935
Supplies and materials:	
Graphics/photo.....	200
Audio tape cassettes.....	80
Printing guides.....	100
	$ 380
Outside services:	
Film processing and duplication.....	250
Commercial filmstrips.....	100
Library books and microfilms.....	225
Laboratory supplies.....	300
	$ 875
Testing and redesign:	
Professional evaluator, 30 hours @ $12.....	360
Staff time, 30 hours @ $8.....	240
Materials.....	100
	$ 700
In-Service education:	
3 lab assistants, 10 hours each @ $4.50.....	135
Miscellaneous:	
Office supplies, car travel.....	100
	$ 235
Total Development cost.....	$8,125

OPERATING COSTS (One Semester)

Administrative salaries:	
1 instructor, 0.20 time @ $10,000	$2,000
Faculty salaries:	
2 instructors, 0.40 time each @ $8,000	6,400
	$8,400
Staff salaries:	
Lab assistants, aides, technicians, 300 hours @ $4.50	$1,350
Librarian, 0.10 time @ $15,000	1,500
	$2,850
Replacements	300
Repair	200
Updating materials:	
40 hours labor @ $8	320
Materials	50
	$ 870
Total Operational Costs	$12,120

INDIRECT COSTS

University overhead - 48% of salaries and wages - which represents costs for:

Administration, salary fringe benefits, custodial and maintenance services, student personnel services (counseling, health, etc.), instructional resources (library, computer, etc.), facilities and equipment depreciation.

Developmental salaries and wages	$ 5,935
Operational salaries and wages	11,250
	$17,185
48%	$ 8,249

The total costs for this one course would be:

Installation Costs	$ 6,100
Developmental Costs	8,125
Operational Costs	12,120
Indirect Costs	8,249
	$34,594

Assume that this course is offered for three years (six semesters) with no major revisions. The developmental costs can be pro-rated over the six semesters. The installation costs should be amortized over a five year period. Therefore the cost per semester would be:

Installation cost (1/10).....	$ 610
Developmental cost (1/6).....	1,354
Operational cost.....	12,120
Indirect costs (48% - 1/6 developmental salaries + operating salaries).....	5,875
Total per semester.....	$19,959

If 120 students take this course, the cost per student per semester will be $166. This amount may seem excessive or relatively low. It is only a useful number for making judgment when compared with the cost of comparable courses or programs.

STUDENT ATTITUDES AND OPINIONS

The attitudes that students express toward instruction can be valuable indications of the results of instruction. To collect the information desired, questionnaires can be prepared in various forms. The most common types are:

a. Adjective checklist
b. Behavior checklist
c. Rating scale
d. Likert scale
e. Semantic differential
f. Ranking
g. Open response

Each type serves a different purpose. The development of a specific questionnaire may require skills beyond those an instructor may possess. A person experienced in designing such evaluation methods is usually available on a campus, and this individual should be contacted for assistance.

INSTRUCTOR AND STAFF REACTIONS

In addition to gathering information from students on their reactions to and opinions about the program, feedback should also be obtained from all involved instructional and service support personnel. One should be sure to include all instructors responsible for the program, tutors, aides, laboratory personnel, clerks, and secretaries who come in contact with students or whose work is related closely to the program. Some of the same types of questionnaires for gathering student reactions may be appropriate for use with faculty and staff. Not only will useful suggestions be received relative to the program, but the personnel involved will be encouraged to feel more a part of the program and thus responsible for its success.

AN INVESTIGATION OF VARIABLES HAVING POSSIBLE EFFECT ON STUDENT MASTERY OF MODULES*

Martha A. Thompson, R.N., M.S.M., M.A.Ed.
and
William P. Osborn, Ph.D.
San Jose State University

A trend toward the use of independent learning modules as a major teaching-learning strategy has been apparent in several nursing programs of the California State University and Colleges System (CSUC). A primary goal of an intercampus nursing project that began in 1973 was the development, sharing, and use of modules which covered content common to participating programs ("Intercampus Development, Distribution," 1973-74).

The three main purposes of the study were: 1) to identify noncognitive factors that have an effect on student mastery of content with a particular instructional format; 2) to determine the degree of individualization achieved with the independent study of modules; and 3) to provide data that could be used in evaluation of the modular learning format which could provide guidance for future curricular applications of this teaching strategy.

Three questions were investigated:

1. To what extent do approach factors that are internal to the student and external to the module affect student mastery of module content? (How the student learns and uses learning materials or experiences.)
2. To what extent do factors that are external to the student but inherent to the module or its utilization affect student mastery of module content? (Beyond the student's experience or ability to control.)
3. To what extent do factors that are internal to the student but perceived by the student as inherent to the module or its utilization affect student mastery of module content? (Perception factors.)

RESEARCH DESIGN

The following definitions were used for this study:

1. Noncognitive: situational and nonintellectual individual characteristics that are not directly involved with the actual learning of material.
2. Closed-minded: having the characteristic of not considering new information as valid unless it comes from an authority figure who is respected.
3. Dogmatic: one who is closed-minded.

The study population consisted of students from six CSUC campuses who were enrolled in nursing courses using any of 18 modules developed under the Intercampus Nursing Project. Participation was voluntary on part of both the campus and the student. Each student was provided with an identification number, known only to the student and the researchers, to allow for identification of the home campus and for the coordination of data from each student for the planned analyses.

Eleven noncognitive factors were used as independent variables in this study. They were: 1) extent of closed-mindedness; 2) extent of previous experience with modular learning; 3) number of hours spent studying a module; 4) extent to which the student felt the student role had been changed with the

*Presented by Martha A. Thompson.

use of modules; 5) type of module according to degree of active student participation required; 6) primary focus of course in which the module was used (theoretical or clinical); 7) scoring control for module posttests (self-scored or other-scored); 8) perceived success with the module; 9) perceived adequacy of the module as preparation for taking the posttest; 10) perceived applicability of the module to future clinical experience; and 11) perceived experiential success (adequacy of the module as preparation for the actual clinical experience). Throughout the study the module posttest score (percentage of items correct) served as the dependent variable and the verbal IQ scores served as the control variable.

Five data collection instruments were used: the Thorndike Screening Test of Verbal Ability; Rokeach's Dogmatism Scale; and three researcher-developed instruments including a module feedback form, a module follow-up form, and an opinionnaire. The Thorndike Screening Test provided the verbal IQ score which was used as the control variable. Rokeach's Dogmatism Scale was used to measure the extent of closed-mindedness of the student. The module feedback form provided information about the student's immediate perceptions of each module, individual posttest scores, study time, and scoring control. The module follow-up form was used to obtain information about delayed student perception of the adequacy of the module as preparation for the actual clinical experience. The opinionnaire was used to obtain information about previous student experience with modularized learning and perception of student role with modularized learning as compared with the traditional lecture method of instruction.

RESULTS AND DISCUSSION

Descriptive data were obtained about posttest and verbal scores and each of the eleven factors being investigated. In addition, an analysis of covariance was completed when data for each independent variable, a verbal score, and a posttest score were all available. The majority of the raw data came from two of the six participating campuses (73.4%) and the samples for the analysis of covariance were often smaller than desired due to lack of all necessary data from individual students.

Posttest scores (N=237) indicated a high degree of success on a majority of the modules. Scores ranged from 51 to 100% with 78.9% of the scores 90% and above. The mean of verbal scores obtained from 555 students was approximately the same as those obtained in previous projects over the previous three years within the CSUC System.

Closed-mindedness

Data were provided by 565 students and the mean score compared reasonably with those previously established in three college and university settings by one of the researchers. The analysis sample (N=115) was divided at the median on dogmatism, providing on either side a relatively closed-minded and a relatively open-minded group. Although the mean posttest score for both groups was high, the more open-minded group made a significantly higher score (93.9%) than did the more closed-minded group (90.6%). This difference was significant at the .05 level and indicates that closed-minded students did not benefit as greatly from modular instruction as did their more open-minded peers.

This outcome supports results of earlier studies related to closed-mindedness (Ausubel, 1970; Osborn, 1973) and points out that any instruction technique requiring a high level of autonomous functioning may hamper the degree of learning of the closed-minded student.

Extent of Previous Experience with Modular Learning

Data were provided by 191 students of which 49.3% indicated no previous experience with modular learning and 24.8% previously had had one course in which modules were used. Thus, the use of modules was a new or essentially new experience for the majority of the students. The analysis of covariance (N=191) failed to show any difference between those with previous experience and those with no prior experience on posttest scores.

Amount of Time Spent Studying a Module

Study hours were indicated for 523 modules; mean time was 4.2 hours. In the analysis sample (N=116) those students who studied fewer hours made a slightly higher mean score than the students who studied more hours; however, the difference was not significant. An increase of study time, therefore, did not increase level of achievement on module posttests.

Student Role Score

Role scores were provided by 243 students and indicated that, as a group, the students felt that their role in modular learning was somewhat on the "independent learner" side as contrasted with their role in traditional lecture classes. The results with the analysis of covariance (N=61) indicated that the students' perception of learning role had no significant effect on posttest performance; however, those who saw no difference in the student role made a slightly higher mean posttest score than those who perceived the role as requiring greater independence.

Type of Module

The majority (84.5%) of 516 students studied modules that were classified as active or moderately active. Analysis of covariance (N=128) indicated that the kind of participation required by the module did not significantly affect the posttest outcome. Although the difference was not significant, there was an interesting linear pattern among the three categories: the lowest mean score was for the most active module; the next was for the moderately active modules; and the highest mean score was for the passive modules. These results do not agree with the generally held belief that active involvement in learning results in increased learning. One possibility is that the more active modules were more difficult for the more closed-minded students, resulting in lower scores for that group. It is also possible that there was an actual difference in the degree of difficulty of the various module categories; thus, the scores achieved on the more active modules, although lower, could represent a better quality of learning.

Primary Focus of the Course in Which the Module was Used

The majority (77.9%) of 516 students studied modules in courses that were classified as mostly or moderately theory. The analysis of covariance (N=128) showed a significant difference (.01 level) on the mean posttest scores between modules used in theoretical courses (93.2 and 96.5%) and those used in clinical courses (88.3 and 89.7%). In considering the outcome with the type of module reported above, in which the higher mean posttest score was made under the more passive learning conditions, it seems that the theory courses utilized more passive modules while clinical courses used more active modules. One possible explanation for higher scores on modules used in theoretical courses is that these courses used examinations and were graded in a traditional manner while clinical courses did not use examinations and were graded

on a pass-fail basis; therefore, the students in theory courses may have been more highly motivated to achieve higher scores on modules which would have more impact on their grades.

Posttest Scoring Control

Posttest scoring control data were obtained for 440 module uses; of these, 60.2% were self-scored. The analysis of covariance (N=126) showed that the other-scored group obtained a significantly higher mean score (95.2%) than the self-scored group (91.3%) (significant at the .05 level). It is possible that the knowledge that another person would see the test caused the student in the other-scored group to be more attentive to the content of the module or to the completion of the posttest.

Perceived Success

Of 480 responses, 90% indicated a feeling of mastery of module content regardless of the posttest score. The treatment of the analysis sample (N=125) showed that there was no significant difference in the posttest performance between the group that felt most successful and the group that felt least successful.

Perceived Adequacy

Of 473 responses, 87.9% indicated a feeling that the module had prepared them adequately for the posttest. The treatment of the analysis sample (N=126) showed a significant difference (.01 level) between the posttest scores of those who perceived the module as adequate (92.7%) and those who perceived the module as inadequate (86.1%). Because the students rated the adequacy of the module after completing the posttest, it is possible that they perceived the module as adequate or inadequate on the basis of personal performance on the posttest. It is also possible that some modules were actually more adequate learning experiences than others.

Perceived Applicability

Of 497 responses, 80.7% indicated that they felt the modules had adequately prepared them for future clinical experience in the area of module content. In the analysis of covariance (N=121) there was no significant difference between the mean scores of those who considered the module applicable and those who considered it not applicable. Therefore, the posttest score did not affect the students' belief of applicability.

Perceived Experiential Applicability

In this category 171 responses were received with 60.2% indicating that the module had prepared them adequately for actual clinical experience. The analysis sample (N=52) indicated that there was no significant difference between those who perceived the module as adequate and those who perceived it as inadequate. Therefore, the past achievement on the posttest was not related to the present perception of adequacy or inadequacy of the module.

SUMMARY AND RECOMMENDATIONS

This study examined factors having possible impact on student mastery of module content. The factors were of three types: approach, utilization, and perception. The approach factors were considered to be internal to the student and external to the module. They included extent of closed-mindedness, extent of previous experience with modular learning, amount of

time spent studying a module, and student role in using modules. One factor in this group, the extent of closed-mindedness, affected mastery significantly.

The utilization factors were those considered to be external to the student and internal to the module or its use. They included type of module, primary focus of course, and scoring control for module posttest. Two of the factors in this group, primary focus of course and scoring control, had significant effect on posttest performance.

The perception factors were those considered to be internal to the student but perceived by the student to be part of the modules or their use. They included perceived success with the module, perceived adequacy of the module as preparation for the posttest, perceived applicability to future clinical experiences, and perceived success after clinical experience. One factor in this group, perceived adequacy of the module as preparation for the posttest, had a significant impact on posttest performance.

Although the results of this study cannot be considered conclusive because of various limitations (small sample size, self-selection, unknown variations of data collection on different campuses, assumption that the module posttest was a true measure of mastery of the module content), they provided support for the results of previous studies and focused attention on the investigation of achievement in use of a particular learning format.

Recommendations include:

1. Greater emphasis on analyzing the learning style of each student so that instruction techniques can be designed to meet individual needs. This study indicated that a student should not be exposed to a single method of instruction regardless of whether it is innovative or traditional. Efforts should also be made to assist students in broadening their individual learning styles; for example, students who are found to be closed-minded could be given increased guidance when first introduced to a new learning format, such as modules. In addition, greater individualization could be achieved by developing modules which have several alternatives for achieving the same objectives. In this way, students can select what is most satisfying and productive for them.

2. The relationship of closed-mindedness to the other variables of this study should be investigated further, as should the results that indicated that learning was significantly greater with modules used in theory-based courses and when tests were other-scored. It may be necessary to reassess grading practices and to devise means, other than grading, to increase motivation and achievement in clinical courses and self-evaluated learning situations.

All purposes of the study were met to some degree. Four noncognitive factors significantly affecting student mastery of module content were identified; greater understanding about the degree of individualization achieved with the modules being used was achieved; and the results served as initial evaluation of the modular program. In addition, areas needing further investigation were identified.

REFERENCES

Ausubel, D. P. and Tenzer, A. G. Components of and neutralizing factors in the effects of closedmindedness on the learning of controversial material. American Educational Research Journal, 1970, 7, 267-273.

Intercampus development, distribution, and use of self-learning modules. Sponsored by Office of the Chancellor, Division of New Program Development and Evaluation, Lee McNall, project director. Long Beach, California, California State University and Colleges System, 1973-74.

Osborn, W. Dogmatism, tolerance for cognitive inconsistency, and persuasibility under three conditions of message involvement. Proceedings, 81st Annual Convention of the American Psychological Association, 1973, pp. 363-364.

USING PERFORMANCE TESTING TO DETERMINE STUDENT ACHIEVEMENT AND TEACHER EFFECTIVENESS IN THE NURSING SKILLS LAB

Jo Ann Crow, Ph.D.
University of Texas at San Antonio

An important part of the Learning Resource Center at the University of Texas Health Science Center School of Nursing at San Antonio is the laboratory area where nursing skills are taught to undergraduate students. Our nursing program is taught during the junior and senior years of a baccalaureate degree program and all the courses taught relate to nursing. The program is organized into four semesters called Level I, Level II, Level III, and Level IV with Level I being the first semester junior students. Level I consists of a 15-hour block and the other three levels are 12-hour blocks. Students must pass the total block before they can progress to the next semester. The program is developed around an integrated curriculum and utilizes team teaching. There are regularly scheduled nursing skills labs for each level.

Our Learning Resource Center facilities include a Resource area and a Nursing Skills Laboratory area. The Resource area has a carrel room with 25 TV equipped carrels, a reading room, a media production area, an examining room, a check-out room, and a closed circuit television facility. The Skills Lab has six complete bed setups, sink and counter areas, seating space for 30 students, and ample mannequins, models, equipment, and supplies to set up simulated clinical situations. Personnel in the LRC include a faculty coordinator who is doctorally prepared in curriculum, instruction, and media; a manager of the Resource area who has administrative and technical skills; a manager of the Skills Lab who has a baccalaureate degree in nursing and several years' clinical experience in a variety of settings; ten graduate students who function as teaching assistants in the Skills Lab; a clerk typist; an audiovisual education specialist; and five undergraduate students who assist in checking out equipment, servicing faculty and student needs, and setting up the individual nursing skills labs.

Faculty on each level develop objectives for classes, nursing skills labs, and clinical experiences and are responsible for the evaluation of students in all three areas. The students' nursing skills are evaluated by the faculty in the clinical area. Teaching assistants, who are students in the master's program with a minimum of two years' clinical experience and whose functional major is teaching, are utilized in the nursing skills labs to help students achieve the objectives for the skills area. Small group instruction is used as the primary teaching strategy within the skills lab, with a maximum ratio of one teaching assistant to ten students and the average being one teaching assistant to seven students. Teaching assistants demonstrate skills to students, observe return demonstrations of the skills by students, and assist students in practicing skills. Students who wish to practice skills in addition to the scheduled time spent in the labs can make arrangements with the nursing skills lab manager who will work with them on an individual basis. A faculty member from each level works with the faculty coordinator of the LRC, the nursing skills lab manager, and the teaching assistants to coordinate all activities that are involved in the skills labs.

In order to determine student achievement of nursing skills as well as to examine the effectiveness of the instruction in the labs, faculty on three levels have begun to develop nursing skills performance tests. These performance tests are given in the labs either during or at the end of the semester.

On two levels the testing is used to assess students' progress in learning the skills and is not considered in determining the students' grades. Testing in these levels is done by both faculty and the teaching assistants. At the other levels the skills testing does count as part of the course grade and all evaluation is done by faculty. On all levels specific criteria for each skill have been developed which reflect both the objectives of the lab for each skill and the specific tasks which are necessary to successfully demonstrate the nursing skill. All tests must be completed within a stated time limit.

Presently being pilot tested at our institution is a type of performance testing designed by Margaret Bell, a master's prepared nurse who is responsible for coordinating the nursing skills lab experiences for Level I students (first semester juniors). A description of this performance testing follows. Level I students come to skills classes twice a week for two hours each time. Skills taught in this level include health assessment and maintenance skills such as TPR, bedmaking, catheter care, Clinitest, and Acetest. Each lab period has specific objectives for students to accomplish. The teaching assistants are given teaching guides, developed by Ms. Bell, which outline strategies to be used to help students achieve the objectives. The teaching assistants and Ms. Bell meet each week to discuss the coming labs and how they will be conducted. Students are given a syllabus at the beginning of the semester which gives the date of each lab, the activity to be taught, objectives for the lab, readings for preparation for the lab, and information on how the activity relates to both theory classes and clinical experiences. Faculty arrange for student learning experiences in the clinical area (which allow students to practice their nursing skills) and, if necessary, may give them additional instruction on how to do a skill. Students are given dates as to when they will be tested on their skills in the lab. They are also made aware that this testing is being done to evaluate their progress in skill acquisition and that the results will not be considered in determining their grades.

The performance testing used by Level I is designed to validate achievement of the Learning Lab objectives through the use of a systematic, structured approach to evaluation. Students are informed in advance when testing will be done and the skills to be covered. When entering the lab for testing, the student randomly selects a hypothetical patient situation. No reference books or notes may be used once the situation selection has been made. Each student is given thirty minutes to read the situation, prepare, and demonstrate the skill or group of skills requested. What the student is expected to demonstrate is stated explicitly on the situation sheet. It is called a "situation sheet" because the skill or group of skills to be demonstrated have been related to a hypothetical patient. Since there is resistance to learning that which is perceived as not having immediate or relevant clinical application, it was felt that the testing should be made as realistic as possible. By using a situation format which showed clinical application within the context of Level I clinical settings, it was hoped that learning would endure until Level II where the skill could be reinforced.

The demonstration is observed by a silent evaluator who has a performance checklist. The performance checklist for each skill consists of specific criteria which relate to the lab objectives for that skill. All tasks necessary to satisfactorily complete the skill are included. The list includes communication skills and cognitive information as well as psychomotor tasks. After the student has demonstrated the skill and the evaluator has completed the checklist, the results are reviewed with the student, thus providing immediate feedback.

To prepare faculty and teaching assistants for their role as test evaluators, as well as to determine content validity and observer error, a series of videotapes were prepared of each situation. The evaluators, using the performance checklists, rated all of the videotaped demonstrations. Their ratings were then compared to identify problem areas in the presentation of the situation, the content of the situation, the validity of the criteria for accomplishment of the skill, and any additional information that seemed necessary. The performance checklists were then adjusted accordingly. This system for training evaluators will continue to be used as changes are made in the lists and until there is reliability in the use of the tool. Thus far, testing has been carried out this way three times, but changes have been made each time.

After all testing is completed, the performance checklist for each student is given to the student's clinical faculty member so that it can be used to help the student strengthen weak nursing skills. Although students were somewhat anxious about the testing at first (even though they knew it did not count on their grades), their response to the testing was enthusiastic and many felt it should be done more than once a semester. Performance testing helped students feel more secure about their skills because it made them aware of how much they could do. Although the simulated experiences in the LRC skills lab are no substitute for actual experience, the structured approach to learning nursing skills through use of objectives, demonstration and practice, and performance testing appears to be an effective approach. Results of the performance tests are also analyzed to determine areas of strength and weakness in teaching. This information is shared with both the teaching assistants and faculty. Teaching strategies are then reviewed and changed, if necessary, to stress items that are consistently missed on the tests, to include information that will enhance the material already present, to increase time for students to practice the skills, and to give students more complete feedback on their progress in the labs. The faculty coordinator of the LRC works with the teaching assistants to assist them in improving teaching techniques and communication with students that may relate directly to the students' learning experiences in the skills lab.

In addition to collecting data on student achievement and teaching effectiveness through the use of performance testing, an attempt is being made to establish some costs of the instruction of students in our skills labs. A profile sheet for each skills lab has been developed which reflects the skills taught; the audiovisual materials, the teaching strategies, and the equipment and supplies used; and how the lab is to be set up. Costs of all equipment and supplies are recorded so that the total cost of materials as well as the costs per student can be identified. This information is then used for budgeting requests for the skills labs. Other cost information such as teaching assistant salaries and faculty time spent in working out objectives and teaching guides are being collected so that sometime in the near future it will be possible to determine the cost per hour per student per type of instruction in the nursing skills labs. When these data are available, it will be possible to compare the costs of the nursing skills labs with the costs of utilizing other strategies such as self-instructional modules.

In summary, acquisition of nursing skills is an important part of our undergraduate program. As part of our Learning Resource Center, the skills labs give us the opportunity to utilize different teaching strategies in a simulated clinical setting and through performance testing, collect data on how well these strategies work, how efficient they are, and how much they cost.

EVALUATION OF A NEW SKILLS TEACHING STRATEGY

Linda K. Larson, M.L.S.
University of North Carolina - Chapel Hill

Evaluation, in the field of education, has been defined as the collection and interpretation of information to aid in judging the value or impact of instruction. Evaluation can be conducted before, during, or after instruction (preferably, all three), and can apply to students, faculty, or the program. At the University of North Carolina School of Nursing, the Educational Support Team is involved in formative evaluation of our new Nursing Skills Laboratory and the method of teaching basic skills which was adopted this fall (1978). The evaluation model being used incorporates the six steps of: needs assessment, statement of the program objectives, evaluation questions to be answered, instrument design, data collection and analysis, and decisions and recommendations.

NEEDS ASSESSMENT

Our evaluation process began with a needs assessment of the skills aspect of the curriculum and involved primarily an informal look at the way nursing skills have been taught in the past. We talked to our students and faculty members as well as to representatives of the Nursing Inservice Education Department at the North Carolina Memorial Hospital. This informal collection of information confirmed what we already suspected, or knew, which was that students and faculty were dissatisfied with the level of skill competence students developed and with the lack of emphasis on skills in the curriculum. Many students were graduating without the necessary competence and confidence in a number of basic-skill areas.

PROGRAM OBJECTIVES

The next thing that we did was to identify our objectives; i.e., what would be the objectives of any new program we would design. First, we wanted to teach students skills in a cost and learning effective manner. We were also interested in a program which would be flexible enough to handle the variety of learners we have at the University of North Carolina School of Nursing, incorporate the principles of adult learning theory espoused by the school, and provide a low pressure atmosphere for the practice and guidance of skills. In addition, we hoped that students would gain confidence in their abilities to perform skills in the clinical area.

IMPLEMENTATION OF THE INSTRUCTIONAL STRATEGY AND FORMATIVE EVALUATION

Last February, we formed a committee composed of administrators (associate dean, business manager), faculty representatives of the curriculum, a representative of the Nursing Inservice Department at the North Carolina Memorial Hospital, an instructional designer, and myself. After identifying our needs, we constructed an observer guide which the committee members took with them on visits to a number of nursing schools throughout the country to discover what others were doing and had learned about the teaching of skills. We also corresponded with several skills coordinators and talked to our own faculty about their experiences in other schools of nursing. In addition, we conducted a literature search which consisted primarily of two computer data,

base searches (one of the educational literature and the other of the medical and nursing literature) to find sources of ideas, research findings, and so forth.

After much consideration, we decided upon an audiovisual modular approach with guided practice. We were interested in individualized instruction; however, for reasons of cost and the need to take advantage of the benefits of peer teaching and practice, we adopted a "partner" system. In this system students were assigned a partner, and the two of them were expected to view the audiovisual materials together and afterwards practice the skill together.

We identified a series of questions that needed to be answered before the strategy could be implemented.

1. How many hours would be necessary for the lab to be open in order to accommodate 140 (70 pairs) students learning one skill per day for three weeks and two per week after that?
2. How many student spaces would be needed?
3. How many slide/tape viewers were needed?
4. How many copies of each skill module would be needed?
5. How would the problems be handled for different clinical groups having special needs in the area of skills?

We knew that the answers to these questions could save us a significant amount of money (considering that each audiovisual module would cost approximately $100 and each slide/tape viewer $325) and that the number of staff and size of space were limited. Those of us on the committee had our own opinions as to the answers to these questions, but none of us could support our opinions with facts.

DEVELOPMENT AND IMPLEMENTATION OF THE INSTRUCTIONAL STRATEGY

At that time, I was enrolled in a computer programming course at the University and realized that the computer could possibly help resolve the problem. With the help of my instructor, I designed a computer program that would schedule students into the skills lab while taking into account the students' schedules (class time and non-class time), modules students had and had not seen, special skills that were needed by certain clinical areas, holidays, number of modules they were to use, the number of copies of the materials, learning spaces (viewers) available, and the number of students that needed to be scheduled through the skills lab. One of the benefits of the computer program was that we were able to use it with a variety of input figures, e.g., 15 viewers, 3 copies of each module, open 10 hours a day. The computer printout would then tell us if it could or could not schedule the students given those conditions. After a few computer runs with different input figures, we were able to identify that we could manage the scheduling of students through the skills lab with a minimum of 12 viewers, a varying number of copies of different modules (3 of some, 2 of others, and 1 of most), and 12 hours of daily operation during the first three weeks and eight hours per day for the rest of the semester. The computer program printed the output in two formats; one for the students and the other for the skills coordinator. The students' printout informed the two student partners when they were scheduled to come to the lab (day and hour) and what module they were to do. The other printout told the skills coordinator how many students to expect at what time and what skills they would be practicing. With this information the skills coordinator could more efficiently schedule the necessary teaching assistants and prepare equipment in advance for a particular day in the lab. Using the computer to schedule students in the skills lab has allowed us to schedule a

maximum number of students within space, hour, and equipment limitations. Because we knew in advance what equipment would be needed on any given day, we were able to eliminate the need for a clinical assistant to distribute equipment on a last minute, demand basis. Although we have not undertaken the task of developing any formal costs analysis, we believe that, thanks to the computer, we are operating the lab in the most cost-effective manner possible. And, we can now concentrate on questions of learning effectiveness.

EVALUATION QUESTIONS

After the new skills teaching system had been designed, we identified some additional questions we wanted to answer. They were:

1. How successfully are the students learning theory of the skills?
2. How successfully are they able to perform the basic skills required of them?
3. How comfortable and competent do students feel about applying what they learn to their patients in the clinical area?

EVALUATION INSTRUMENTS

Several evaluation instruments had been built into the system from the beginning. They included multiple choice tests for measuring students' knowledge of the skills and checklists for measuring the actual performance of the skills.

Theory Testing

As previously described, each set of student partners is scheduled into the lab to view a module. They are asked to use the workbook and answer the "self-test" questions in it. The students may go back to the module if they are unsure of something. When the students think they understand the theory, they each take a six item multiple choice test for that particular module. The test questions are selected from those provided by the commercial producers of the module. The students can then check their answers and discuss any problems or misunderstandings they might have with the teaching assistant. The results of the test are recorded. When the teaching assistant is satisfied with the students' grasp of the theory, the students proceed to the skills practice room. Thus far, we have analyzed the results of these short quizzes, both informally and sporadically, and have found that most students do quite well. This method of learning skills is definitely a low pressure approach which is intended to give the students feedback as well as provide us with data regarding the effectiveness of a module or any problems associated with it. After the semester is over, we will analyze the results of these objective tests in greater detail. The students' answers to the questions have been marked on computer answer sheets, and we will be able to use the computer to analyze the test results.

Questions similar to those provided by the producer of the learning modules will be used to evaluate the students' understanding of the theory of the skills on the final course examination. Computer answer sheets will also be used for this test.

We were very interested in any comparison that could be made between students who were taught the "old way" versus our new approach. This proved to be very difficult to evaluate since nursing skills are learned in the lab as well as in clinic, and there had not been any systematic collection of data on student skill performance prior to this time. After consultation with a

research specialist at the school, we concluded that the only way to get some comparative data would be to test the seniors on skills theory at the beginning of the fall semester this year by way of an objective multiple choice test. Items for the test were again selected from the items supplied by the producer of the modules. This same test will be administered to the current juniors when they are seniors next fall. We realize that there are some problems with the reliability of the data. However, we do believe that we will be able to draw some conclusions from the results about how much of a difference the new approach is making in terms of the students' understanding of basic skill theory. Also, our plans are to question clinical instructors about their perceptions of improvements in student performance as a result of the new approach to teaching skills.

Performance Testing

The students practice in the skills lab with a partner under the teacher's guidance and supervision. This practice session is meant to be a low pressure learning situation and students are not evaluated on their performance at this time. They can work as long as they need in order to master a skill.

The students are expected, when they feel ready, to advise the clinical instructor that they are ready to be evaluated on a particular skill. The instructor then has the responsibility for checking the students' performance against the performance checklist provided in the manual. If students have difficulty in demonstrating the skill, they are referred back to the lab for extra help. We are still in the process of evaluating performance and compiling data. We will be analyzing these data soon.

Analysis of the objective multiple choice tests should tell us how successful the students have been in learning skill theory as well as help us identify problems that need to be addressed. Discussion with clinical instructors and the analysis of the performance checklist results will give us information about how well students are actually performing the skills they are learning in the lab.

Attitudes Testing

In addition to evaluating skill theory and performance, we were interested in learning about how students felt about the lab; i.e., how competent and comfortable they felt about applying the skills they had learned. We plan to evaluate these feelings in a variety of ways.

Very early in the semester, we obtained some general feedback from students by asking three open-ended questions:

1. What have you liked so far about the Skills Lab experience?
2. What have you disliked so far about the Skills Lab experience?
3. What changes would you like to suggest and/or what comments would you like to make concerning the Skills Lab?

The responses were anonymous and resulted primarily in suggestions about organizational problems rather than the instructional method. Many of the suggestions were excellent, and we made the appropriate changes where we could.

After we had implemented this skills learning system for three weeks, and just before the students were scheduled to go to their clinical areas for the first time, we asked students to rate themselves as to how prepared they were for each of the skills they had learned in the Skills Lab. Based on this feedback from students, we will make changes in the computer program so that students will have a greater opportunity to practice those skills with which

they had difficulty this year. We will then ask the same questions next year to find out if our changes have made a difference.

CONCLUSION

For almost a year now, we have been involved in developing and implementing a formative evaluation system. We are still very much involved in the last three steps: instrument design, data collection and analysis, and decisions and recommendations. During the implementation of the system, we have tried to be flexible, be responsive to feedback, and make adjustments where it was possible. It is very important to have a positive attitude toward the evaluation process and an open-mindedness about problems and solutions if any evaluation system is to be successful. In the final analysis, any well-run instructional evaluation program should be under constant scrutiny and should be flexible enough to adapt to changes that may occur in needs and objectives.

Students in the University of Alabama Family Nurse Practitioner (continuing education) program learn retinoscopy by using a spot retinoscope, a lens bar and pre-set schematic eyes.

RESEARCH STUDIES

This paper and the following two abstracts represent research studies that were presented at the conference.

STATUS OF INNOVATIVE PROGRAMS IN NURSING EDUCATION - A SURVEY*

Martha A. Thompson, R.N., M.S.N., M.A.Ed.
San Jose State University

Traditional teaching methods and activities are being challenged today for a number of reasons. In recent years there have been many technological advances, sociological changes, alterations in the health care delivery system, and an explosion of medical knowledge. Future changes in these areas are unknown but are expected to continue at a rapid rate.

The challenge exists today for nursing educators to provide an educational process which is not only student-centered but also responsive to professional and societal needs. It is necessary to prepare practitioners of nursing who can function independently in a dynamic profession and society. There is an ever increasing need to respond to students from varied backgrounds who are eager to become involved in their own learning and who expect their education to be relevant to "real world" problems as well as compatible with personal and professional goals and needs. If these needs are to be met, it is essential that instructional strategies be selected which encourage active involvement of the learner, facilitate assimilation of knowledge for use in varied and changing situations, recognize individual learning needs and styles, and maximize the potential of the learner.

The primary goal of this survey was the collection of data about innovative programs in nursing for the purpose of describing the current status of nursing programs in relation to the use of nontraditional teaching methods. This survey specifically examined the status of innovative programs in nursing in National League for Nursing accredited associate degree and baccalaureate programs with an enrollment of 250 or more. The three areas in which data were obtained included: 1) new approaches to instruction, 2) instructional design personnel, and 3) funding.

A two page questionnaire covering the three areas of investigation was sent to 40 associate degree and 132 baccalaureate degree programs. Seventy-six programs (44.1% of the target population) responded. The respondents included representation from all regions of the United States with the final sample being comprised of 18.4% from the Southern region, 19.7% from the Western region, 30.3% from the Midwestern region, and 31.6% from the North Atlantic region. The sample included 17 associate programs and 59 baccalaureate programs which is a ratio closely similar to that of the original target population. In relation to the target population, the least response came from the Southern region (31.1%) and the greatest from the Western region (60%). When considering actual number of respondents, however, the greatest numbers came from the North Atlantic region (31.6%) and the Midwest region (30.3%).

*Survey was a sabbatical leave project during academic year ending in June of 1976.

RESULTS AND DISCUSSION

Once the data were received from participating programs, an analysis in each area of investigation was completed in order to gain an understanding of the status of innovation among the respondents.

In the area of new approaches to instruction, information was requested about the current use of some type of new approach to instruction including identification of general methodologies, specific strategies, and type of available facilities. In addition, a request was made for examples of materials used by students which would illustrate the particular teaching strategy. Assurance was given that complete credit would be given if any of the materials were used as examples in any published materials. Otherwise, complete anonymity was promised regarding the publication of individual program practices.

"No innovation" was the response of 25% of the programs answering the questionnaire, including 47.1% of associate degree respondents and 18.6% of baccalaureate respondents. The highest percentage of associate degree programs reporting no innovation was in the North Atlantic and Southern regions and that of baccalaureate programs in the North Atlantic and Western regions. In addition, the "no innovation" response occurred most frequently in those programs with an enrollment of 250-449.

The reason for the lack of use of innovative approaches to instruction was not obtained with this survey. It is possible that there is inadequate fiscal support for nontraditional methods or that faculty members are unprepared or reluctant to enter into nontraditional teaching roles. Further research in this area is warranted to determine the basis for lack of innovation and to identify ways of facilitating change in role and technique to improve learning.

Of those programs who indicated that they were using some type of new approach to instruction, 84.2% provided varying levels of descriptive information about their innovative teaching strategies. In addition, 35.4% of those claiming innovation included samples of student or course materials which would illustrate the strategy.

Each respondent claiming innovation identified one or more general methodologies being used. Those referred to with the greatest frequency were independent study (also including autotutorial learning and self-instruction) (79.2%), mediated instruction (60.4%), self-paced learning (52.1%), and individualized instruction (also including personalized instruction) (33.4%). Other methodologies mentioned with less frequency were mastery learning (18.8%), computer-assisted instruction (14.6%), simulation learning (10.4%), and competency-based instruction (10.4%).

In addition to general methods identified, 85.4% of the respondents claiming innovation also listed specific strategies being used. Modules, learning packages, or independent study packets were mentioned with the greatest frequency (59.8%), contracts and independent study agreements next (39%), and learning activity guides, study guides, or learning guides next (12.2%). Modules and contracts used in conjunction with one another were cited by 19.5% of those claiming innovation.

The general methodologies and specific strategies identified by the respondents in this survey reflect those which have been increasingly discussed in nursing literature in recent years. These trends are also demonstrated in the literature of other disciplines. It is clear from published reports that innovation requires faculty dedication and education as well as

special financial support for their initiation, implementation, and evaluation. Continuation and expansion of such published reports should be encouraged so that programs wishing to try new methods can benefit from the experiences of others. Expanded sharing of learning materials should also be encouraged since there are many commonalities of content among nursing programs. Lack of sharing of materials may result from the increasing pressure on faculty to publish, the concern that they would be used without proper permission or credit, or the fear that others would judge their work as less than excellent. Methods should be identified which would make open sharing possible and provide recognition of those faculty who participate in this.

Many of the strategies cited can help to achieve active student participation as well as increased responsibility of the learner. They can also help to bring about an improved integration of learning by increasing the proximity of theoretical background to related clinical practice. Use of such strategies helps to expand the repertoire of learning skills and methods of individual students and provides variety so that individual learning styles can be more adequately recognized. At the same time, the use of these strategies requires a change in the teaching role from that of a giver of information to one of facilitator of learning. It is crucial, if such methods are to be expanded, that faculty members be assisted in learning and developing in this nontraditional role. Faculty must also be provided with adequate support services to make innovation possible as well as recognition for their efforts to improve instruction.

The availability of one or more learning facilities for use by students using the various strategies was indicated by 85.4% of those claiming innovation. These facilities were referred to by a wide variety of titles as follows:

Skills Lab, Practice Lab, Nursing Lab, or Nursing Arts Lab (29.3%)

Learning Resource Center, Learning Resource Lab, Instructional Media Center, Instructional Materials Center, Nursing Media Center (29.3%)

Independent Study Lab, Auto-tutorial Lab, Self-Learning Center, Self-Learning Lab, Self-Instructional Lab (24.4%)

Multimedia Lab, Multisensory Lab, Media Lab, Audiovisual Lab, Media Library (19.5%)

Learning Lab (17.1%)

It was clear that these facilities were used for a wide variety of courses including the teaching of basic skills and clinical and theoretical aspects of nursing at all levels of the curriculum, and to achieve both required learning and enrichment learning.

Fifty-two respondents provided information about the availability, qualifications, tasks, time allotment, and funding for instructional design personnel. Of these, 42.3% stated that no one was readily available to the nursing faculty to assist with planning, implementing, and evaluating new methods of instruction. The North Atlantic region showed the greatest frequency of no personnel (50%) while other regions ranged from 37.5 to 41.7%. It is essential that instructional design personnel be available to assist with innovative educational programs. The lack of such personnel in such a high percentage of programs may help to explain why nontraditional methods are

not being attempted in more settings. In addition, the lack of such personnel may be the result of a lack of available funding or the lack of administrative support for experimentation with nontraditional teaching methods. Further research into the actual cause is warranted. In spite of this, it is apparent that innovation is occurring in many programs where no instructional design personnel are available. This implies that nursing faculty in such programs are dedicated and motivated to the improvement of instruction.

Of the 30 programs which claimed ready availability of instructional design personnel, 15 (50%) were prepared at the doctoral level and 9 (30%) at the masters level. In addition, 12 programs (40%) mentioned previous experience as a special qualification. The specialty areas mentioned most frequently for advanced educational preparation were educational/instructional technology (50%) and computer science, systems, or communications (30%).

The descriptions of the typical duties of the instructional design personnel indicated a wide range of responsibilities. Those things listed with the greatest frequency (by at least 33.3% of the respondents) were as follows:

Instructional planning and design
Implementation (includes resources, media, equipment, and testing)
Instructional development
Media production
Evaluation
Faculty development
Design and/or management of learning facilities

There was wide variation in the time allotted for the instructional design personnel to perform their duties. While some respondents stated that they had one or more full time personnel performing these duties, 36.6% stated that personnel were allotted less than half time, and 23.3% stated that no time was officially allotted for the performance of these duties. In spite of minimal or lack of official time in 43.3% of the cases, only 16.7% indicated that the amount of time allotted was inadequate. The reason for this was not apparent. It is possible that instructional innovation is not important to the faculty in those programs.

Fifty-two respondents provided information about the funding of innovative programs in their setting. They were asked to identify the source of funding in six categories: instructional planner, faculty implementing new programs, facilities (including space and furnishings), equipment (hardware), media (print and nonprint), and other. The sources of funding to be checked in each of these categories included institutional, special grant or project, and other.

The greatest lack of funding was shown in the category of instructional planner (42.3%) while the categories of faculty, facilities, equipment, and media were each was funded 92.3 to 98.1% of the time. In addition, eleven respondents mentioned the availability of funding for special needs such as consultants, secretarial help, lab assistants, travel, and workshops in the "other" category.

Respondents who indicated that funding was available to support innovative programs in the six categories, identified the source of this funding. In each category, based on the number of respondents who stated that funding was available, support by the institution only, ranged from a low of 43.1% for equipment (N=51) to a high of 66.7% for faculty (N=48). Support of the various categories by special funds only, ranged from a low 12.5% for faculty

(N=48) to 20% for instructional planner (N=30). Support of the various categories by a combination of the two funding sources ranged from 20.8% for faculty to 39.2% for equipment. When a combination of the two funding sources was indicated, data about the ratio of this combination were not obtained.

The funding by the institution only in the category of instructional planner was best in the Midwestern region (80%) while the region showing the least amount of sole support by the institution was the West (14.3%). Those regions showing the greatest dependence on special funds only for the support of the instructional planner were the North Atlantic (33.3%) and the West (28.6%). The region which showed the greatest use of a combination of institutional and special funds was the West (57.1%).

Those respondents who indicated the use of special funds or a combination of special and institutional funds were asked to identify the specific sources of the special funds. A total of 57 special funding sources were identified. Included were federal grants (59.6%), foundations (19.3%), private donations (12.3%), and state or institutional innovative grants (8.8%). State or institutional innovative grants provided support in the least number of categories (faculty, media, and other). Private funding was represented in four of the six categories (faculty, facilities, equipment, and media). Foundations provided funding in five of the six categories (the only category excluded was "other"). The only source of funding providing support in all six categories was that of federal grants. In all categories, federal funding was identified as the source of the special funds with the greatest frequency.

It is apparent from this survey that the institution in which an innovative program is based assumes a significant amount of fiscal responsibility for that program. This support can be encouraged by the development of quality programs which provide effective learning and are cost effective. At the same time, many nursing programs depend on special funds to support innovative programs. The dependence upon special funds is not necessarily undesirable; however, it is essential that the home institution be prepared to assume responsibility for programs which prove successful so that the funds which have supported the innovation will not be wasted. Efforts must be made to convince administrators of the worthiness of innovation and to develop quality programs when funding is available. Further investigation is needed to determine the extent of and reasons for discontinuation of innovative programs after special funding has stopped.

SUMMARY

The primary goal of this survey was the collection of data about innovative programs in nursing from a specific target population. The purpose for collecting this data was to be able to describe the current status of nursing programs in relation to the extent and practice of innovative programs.

The three areas in which data were collected and analyzed, and from which recommendations were made: 1) new approaches to instruction, 2) instructional design personnel, and 3) funding. In the discussion of new approaches to instruction, the extent of innovation or lack of innovation was described, general methodologies and specific strategies were identified, and types of learning facilities were listed.

In the discussion of instructional design personnel, the areas covered were availability, qualifications, tasks, time allotment, and funding. Other categories which were discussed in relation to funding availability and sources were faculty, facilities, equipment, media, and other. Sources of funding included institutional, special grants or projects, a combination of

these two, and other. Areas of lack of funding and high level of funding in relation to each source for fiscal support were identified.

In each of the three areas discussed, potential explanations were attempted and recommendations for further research were made. Major questions which were raised by this survey are:

1. What are the specific reasons for lack of use of new approaches to instruction? Is it due to inability to change teaching roles, lack of support by administration, lack of knowledge about new approaches, lack of prepared personnel to facilitate change, inadequate extrinsic rewards for faculty, insufficient funding, or other reasons? If specific reasons could be determined, a plan of action to facilitate innovation could be established.

2. What methods can be utilized to enhance more open sharing of instructional materials and experiences?

3. What are the causes for lack of instructional design personnel or, when they are available, the lack of official time allotment for the performance of their duties? Are these due to lack of funding, lack of administrative support, lack of faculty recognition of need for such personnel, or decreased interest and motivation of faculty to utilize such personnel when they are available?

4. What innovative programs are discontinued after special funding has stopped and what were the reasons for discontinuing them? Was it because the programs were unsuccessful or because local funding was not available? What is the extent of special funding which has resulted in high quality programs which have been maintained (or discontinued) when the special funding has ended?

5. How do faculty manage to bring about innovative change in spite of lack of funding, personnel, time allotment, extrinsic rewards, and so forth? What are the characteristics of those faculty who can achieve this?

It is apparent that this survey provided some insight into current trends and practices in the area of innovative programs and their support within those nursing programs who responded to the questionnaire. It is also apparent that many questions were raised which require further investigation before valid conclusions can be drawn.

REFERENCES

Ausubel, D. P. and Tenzer, A. G. Components of and neutralizing factors in the effects of closedmindedness on the learning of controversial material. American Educational Research Journal, 1970, 7, 267-273.

Intercampus development, distribution, and use of self-learning modules. Sponsored by Office of the Chancellor, Division of New Program Development and Evaluation, Lee McNall, project director. Long Beach, California, California State University and Colleges System, 1973-74.

Osborn, W. Dogmatism, tolerance for cognitive inconsistency, and persuasibility under three conditions of message involvement. Proceedings, 81st Annual Convention of the American Psychological Association, 1973, pp. 363-364.

ABSTRACT*

AN ANALYSIS OF LEARNING RESOURCE CENTERS IN NATIONAL LEAGUE FOR NURSING ACCREDITED BACCALAUREATE SCHOOLS OF NURSING AS A FUNCTION OF THE ACADEMIC QUALIFICATIONS OF DIRECTORS AND THE ADMINISTRATIVE, FISCAL, AND ORGANIZATIONAL STRUCTURE OF CENTERS

Jean Jefferson Mason, R.N, Ph.D.
University of Pittsburgh, 1976

The purpose of this study was to analyze the relationships among specific academic, fiscal, and organizational variables of Learning Resource Centers in National League for Nursing accredited baccalaureate schools of nursing in order to determine which factors were most effective in producing a high quality center. It is further hoped that the data obtained can facilitate the improvement of existing centers.

The population consisted of 161 schools of nursing which reported operating a multi-media learning resource center. Of these, 134 (83.2%) participated in the study.

Fulton's Evaluative Checklist, An Instrument for Self-Evaluating an Educational Media Program in Colleges and Universities was supplemented with a questionnaire which was designed to measure selected demographic data. The instrument was pilot tested, revised, and used to collect data for the study.

These data were analyzed through the use of multiple correlation and linear regression techniques. Selected statistics included the Chi Square, Spearman Rank Order, and Median tests. The alpha level was set at $p < .05$. A national profile of quality was developed using median scores for each of 21 variables in Fulton's Checklist. These variables included specific statements which were related to administrative commitment to the media program, educational media services, the educational media center, physical facilities for educational media, and the educational media budget. Multiple regression analysis indicated that 162 pairs of variables were significant. The strongest variable was the existence of faculty development programs in the uses of educational media. Faculty and student use of media was the next strongest variable. It was followed by storage and retrieval of media and the development of a media budget. Only 12 of the 21 variables proved to be significant.

Analyses which compared the 21 variables of quality with the demographic data indicated stronger relationships between program quality and level (rather than the field) of academic preparation of LRC directors. Significantly more dollars per student, however, were allocated to media programs whose directors were academically prepared in media rather than nursing. The existence of a separate budget for media (regardless of the director's field or level of academic preparation) correlated with higher quality in administrative commitment, production of new media, and the existence of a learning resource center which was administered by schools of nursing.

Finally, a median score was computed for each school. The schools which tied for each score were grouped, placed in rank order, and compared with the age of learning resource centers, media expenditures per student, hours worked by LRC directors, titles purchased, and the number of titles produced.

*Complete study available from Dissertation Abstracts International, 1976, 37, 1359-A (University Microfilms No. 76-19,1921).

The schools which rated the highest quality were between four and five years old, had the largest student populations, spent the most dollars for media, and purchased the most titles. They were only slightly exceeded in production of new titles by the schools which ranked second in quality.

The youngest schools (mean = 2.4 years) ranked 6th and 7th, spent the fewest dollars for media, had directors who worked less than 40 hours per week, purchased fewer than 200 titles, and produced less than 12 titles. The school ranking lowest in quality had operated a learning resource center for more than five years and reported no production of media.

Conclusions drawn from this study included a profile of quality and guidelines for the design and operation of a learning resource center in NLN accredited baccalaureate schools of nursing.

ABSTRACT*

DEVELOPMENT OF A CLASSIFICATION SCHEME OF PUPIL QUESTIONS ASKED BY NURSING STUDENTS WITHIN A SELF-INSTRUCTIONAL LEARNING ENVIRONMENT

Kathleen Joyce Mikan, R.N., Ph.D.
Michigan State University, 1972

Many institutions of higher education are incorporating the use of structured, multi-media, self-instructional learning systems into their curriculums as one means of providing more individualized instruction. Monitors have been assigned to be available when these systems are in operation to provide whatever assistance is needed; part of the monitor's responsibility is to handle students' questions as they occur. The purposes of this study were: (1) to develop a classification scheme of questions college pupils asked within the context of a structured, multi-media, self-instructional learning environment as a basis for designing a training program for monitors and (2) to determine what, if any, effects certain situational factors have on the number and types of questions asked.

The study was undertaken in two phases. Phase I was the development of a classification scheme of pupil questions and Phase II was an application of the classification scheme to a data-gathering investigation. A classification scheme of pupil questions was developed from a review of the classification schemes proposed in the literature, from questions collected during a preliminary investigation, and from the questions asked during the data-gathering investigation.

During the data-gathering investigation, six hypotheses were tested. Data were collected during sixteen 20-minute observations of each of three different structured, multi-media, self-instructional learning units in the content area of nursing with each unit having different terminal behaviors. Two monitors with different levels of professional expertise were observed during selected observation times; the monitors were asked to circulate or to remain stationary during randomly determined observation times. Data were collected by use of a Variable-Interval Sequence-Action Camera, a continuous two channel audio tape, and student time cards. The number of questions asked by college pupils was analyzed by a three-way analysis of variance. The types of questions were categorized according to the classification scheme developed in Phase I. Comparisons of the frequency counts and proportions of the different types of questions asked were made according to the three different learning units, expertise of the monitor, and movement of the monitor.

A total of 194 questions was collected and classified by three judges into eight categories. All three judges agreed 100 percent on the classification of 117 questions for a percentage of agreement of 60 percent; at least two of the three judges agreed on the classification of 183 questions for a percentage of agreement of 94 percent.

Based on the data collected during the data-gathering investigation and the analysis of those data, the number and types of questions asked by college pupils during the "normal" operation of three structured, multi-media, self-instructional learning units varied according to differences in the general

*Complete study available from Dissertation Abstracts International, 1973, 33, 4803-A. (University Microfilms No. 73-5445).

type of terminal behaviors. An instructional unit in the content area of nursing designed to help students develop psychomotor skills elicited significantly (at the 0.5 level) more student questions than instructional units designed primarily to develop cognitive skills. No differences were observed in the number and types of questions asked according to (1) whether the monitor circulated or remained stationary, or (2) whether the monitor was a registered nurse or a nursing student.

EVALUATION OF CONFERENCE

INTRODUCTION

All conference attendees, except those from the host institution, were invited to participate in a study to: 1) evaluate the short- and long-term impact of the Learning Resources Center (LRC) Conference and 2) describe the characteristics of the conference participants and their LRC's. The conference participants were asked to complete different instruments at indicated times during and following the conference: at the beginning of the conference, a Participant's Profile (Appendix A); during the conference, a Plan to Enhance LRC Utilization (Appendix B); and six months after the conference, Progress Reports (Appendix C).

The specific purposes of the instruments were to: 1) collect descriptive data regarding conference participants; 2) identify needs and problems that were being encountered in LRC's in schools of nursing; and 3) identify the level to which progress was made in meeting needs or resolving problems in LRC's within six months following the conference.

All evaluation instruments were distributed together as part of the conference registration materials. All the registration materials were assembled in a three-ring notebook.

All evaluation instruments were precoded in order to maintain confidentiality and for data analysis. Data obtained from the Participant's Profile, Plan to Enhance LRC Utilization, and the Progress Reports are reported in this section.

PARTICIPANTS' PROFILE

A total of 145 individuals attended the LRC Conference. Of this number, nine were from the host institution. The remaining 136 individuals came from various parts of the United States and Canada and represented different institutions or agencies (See Appendix D for the number of participants by state and region). Twenty-seven institutions sent more than one representative, and one institution sent as many as three people to the conference.

The positions or roles of the conference participants appear in Table 1. They were: 1) Dean or Director of school of nursing; 2) Director of LRC which included assistant LRC directors, coordinators of LRC's, autotutorial laboratory coordinators, and coordinators of nursing or skills laboratories; 3) faculty; 4) LRC Personnel which included librarians and media personnel employed by a school of nursing; 5) institutional support personnel which included librarians, media coordinators, educational specialists, media consultants, and directors of campus-wide instructional resource centers who provided AV services to the school of nursing rather than being employed by a school of nursing; 6) nursing department in hospital which included individuals in in-service departments of hospitals; 7) school of nursing administrative personnel which included administrative assistants to the Dean; and 8) other--which included individuals from non-educational institutions such as architects, planning consultants, representatives of governmental agencies, audiovisual sales managers and managers of professional services in commercial companies. The addresses of the participants indicated that 113 were associated directly with a school of nursing, 5 were from another health science school such as pharmacy or medicine, 11 were associated with a school that had a combination of health science disciplines, and 7 were from other types of institutions/agencies.

All participants were asked to identify if their institution/agency had an LRC or planned to develop one. Of the 136 who responded to the question,

110 indicated that they had an LRC, 21 indicated that they were planning to develop one, and 5 indicated they did not have an LRC nor did they plan to develop one.

TABLE 1. POSITION OR ROLE OF CONFERENCE PARTICIPANTS (N=136)

Position/Role	Number	Percent
Dean or Director Nursing School	9	6.6
Director of LRC	32	23.5
Faculty	46	33.8
LRC Personnel	17	12.5
Instructional Support Personnel	18	13.3
Nursing Department in Hospital	4	2.9
School of Nursing Administrative Personnel	4	2.9
Other	6	4.4

Participants were asked to identify their primary relation to their LRC. This information is presented in Table 2. Since Table 2 reflects how the conference participants perceived their relationship to the LRC, the numbers and categories are different than those in Table 1.

TABLE 2. CONFERENCE PARTICIPANTS' RELATIONSHIP TO LRC[1] (N=136)

Relationship	Number	Percent
Dean or Director Nursing School	8	5.9
Director of LRC	49	36.0
Faculty	41	30.2
LRC Personnel	18	13.2
Other Instructional Support Personnel	10	7.4
Other School of Nursing Administrative Personnel	4	2.9
Outside of Educational Institutions	6	4.4

[1]Existing or developing LRC's

Status of LRC's in Schools of Nursing

Of the 136 individuals at the conference, 118 identified themselves as representing a school of nursing while 18 represented some other type of institution/agency. The 18 individuals who did not represent a school of nursing were eliminated from further data analysis. The primary relationship of the 118 individuals to their LRC is given in Table 3. In cases where there was more than one representative from a single school of nursing, the data were compiled into a single entry. The number of different schools of nursing represented at the conference was 90. The geographic distribution of the 90 schools of nursing is presented in Table 4. Seventy-seven schools of nursing reported having an LRC, whereas thirteen reported they did not have but planned to establish one.

TABLE 3. PRIMARY RELATION OF SCHOOL OF NURSING PARTICIPANTS TO LRC[1] (N=118)

Relationship	Number	Percent
Dean or Director of Nursing School	8	6.8
Director of LRC	43	36.4
Faculty Member	37	31.4
LRC Personnel	17	14.4
Instructional Support Personnel	9	7.6
Other Nursing School Administrative Personnel	4	3.4

[1]Existing or developing LRC's

TABLE 4. SCHOOL OF NURSING REPRESENTATION BY GEOGRAPHIC REGIONS[1] (N=90)

Regions	Number	Percent
New England	5	5.6
Middle Atlantic	6	6.7
East North Central	13	14.4
West North Central	8	8.9
South Atlantic	23	25.6
East South Central	14	15.6
West South Central	12	13.3
Mountain	4	4.4
Pacific	4	4.4
Canada	1	1.1

[1]See Appendix D for states coded in these categories and number of representatives from each state.

TABLE 5. SCHOOL OF NURSING PARTICIPANTS ACCORDING TO WHOM THEY REPORT (N=112)

Participant		PERSON TO WHOM REPORTS					
		Dean Nursing School	Dean Outside Nursing School	LRC Director	Other Nursing School Administrator	Other	Total
Dean	N	1	8	0	0	0	9
	%	11.1	88.9	0	0	0	100
LRC Director	N	23	2	1	3	0	29
	%	79.3	6.9	3.5	10.3	0	100
Faculty	N	31	0	2	11	0	44
	%	70.5	0	4.5	25.0	0	100
LRC Personnel	N	8	1	1	2	2	14
	%	57.2	7.1	7.1	14.3	14.3	100
Instructional Support Personnel	N	6	0	2	2	1	11
	%	54.5	0	18.2	18.2	9.1	100
Other Administrative Personnel	N	4	0	0	0	0	4
	%	100.0	0	0	0	0	100

Participants were asked to identify the title of the person to whom they reported. All school of nursing participants were considered when analyzing these data. Of the 118 individuals associated with a school of nursing, 112 responded. These data are given in Table 5. Most of the Deans reported to another Dean outside of the school of nursing. Seventy-nine percent of the LRC directors reported directly to the Dean of the school of nursing, while ten percent reported to an associate dean or another type of administrator within the school of nursing. In the cases where the table indicates that a person of one title reports to a person of the same title (e.g., a Dean reported to a Dean), the data revealed that the person was an assistant to the other person, i.e., the assistant dean reported to the Dean or the assistant LRC director reported to the LRC director. In the 11 cases where the faculty reported to another school of nursing administrator, the administrator was either a level or a departmental chairman. It is of interest to note that two faculty members reported to the LRC Director. This organizational arrangement occurred in those situations in which the nursing skills practice area was part of the LRC. The faculty who supervised the student in the learning of these skills reported to the LRC director.

The different schools of nursing which were represented at the conference and which had an LRC are described in Table 6 according to type(s) of nursing education programs.

TABLE 6. TYPES OF NURSING EDUCATION PROGRAMS REPRESENTED WHICH HAD AN LRC (N=77)

Programs	Number	Percent
Diploma	12	15.6
Associate Degree	16	20.8
Baccalaureate	21	27.2
Graduate only	0	0.0
Associate and Baccalaureate	7	9.1
Baccalaureate and Graduate	17	22.1
Associate, Baccalaureate, and Graduate	4	5.2

Some participants reported that their schools had other types of nursing programs such as licensed practical nursing programs, nurse practitioner programs, and programs for registered nurses. Usually these programs were affiliated with one of the generic nursing programs and were not addressed as a separate group. Since the number in the "graduate program only" was zero, this category was deleted from further analysis.

An attempt was made when designing the Participant Profile to obtain descriptive data about the LRC associated with a school of nursing in terms of location, size, personnel, learning activities, services, and types of users.

The descriptive data are based on a sample of the 77 different schools of nursing with an LRC.

Location

Data in Table 7 reflect that 53 out of the 77 schools of nursing have their LRC housed within the confines of a school of nursing building. An additional 10 were located within a school of nursing building, but their building was also affiliated with the campus LRC or library. LRC's in other schools of nursing were located in other parts of the college or university.

TABLE 7. LOCATION OF LRC ASSOCIATED WITH SCHOOL OF NURSING (N=77)

LRC Location	Number	Percent
Within school of nursing building	53	68.8
Within school of nursing building and affiliated with campus LRC/library	10	13.0
Shared with other health professional schools	6	7.8
Another building on campus	5	6.5
Part of all-campus LRC	1	1.3
Part of university library	1	1.3
Not reported	1	1.3

In Table 8, the LRC is described according to the types of nursing education programs offered in the schools of nursing and the location of the LRC. Except for schools offering only an associate degree program, the majority of the LRC's were situated within the school of nursing building. There was more variation in the locations of the LRC's in schools offering the associate degree than in schools offering other types of nursing programs. All of those schools of nursing which offered three types of nursing programs had their LRC's located within a school of nursing building.

Size

The conference participants were asked to indicate the size of their LRC. Forty-eight LRC's were described. Many of the descriptions included the approximate size of rooms in the LRC. These room sizes were then converted into square feet. Table 9 reflects the results. The sizes ranged from less than 400 square feet to over 10,000 square feet. The category 900-1599 square feet was the mode with a frequency of 15. Over 35 percent reported an LRC between 900-2499 square feet or between a 30x30 and 50x50 size area. The fact that 29 or 37.6% of the participants did not provide any information about the size of their LRC's should be noted. When the LRC is described according to size and type of nursing education program (Table 10), interesting patterns appear. One-third of the schools offering a diploma program had LRC's of less

TABLE 8. LRC LOCATION BY NURSING EDUCATION PROGRAM (N=77)

Location	Diploma N	Diploma %	Associate N	Associate %	Baccalaureate N	Baccalaureate %	Associate and Baccalaureate N	Associate and Baccalaureate %	Baccalaureate & Graduate N	Baccalaureate & Graduate %	Associate, Baccalaureate & Graduate N	Associate, Baccalaureate & Graduate %
Within school of nursing building	10	83.3	8	50.0	16	76.2	4	57.1	11	64.7	4	100.0
Within school of nursing building affiliated with campus LRC/ library	0	0.0	4	25.0	1	4.8	2	28.6	3	17.6	0	0.0
Shared with other health professional schools	0	0.0	1	6.2	2	9.5	1	14.3	2	11.8	0	0.0
Another building on campus	1	8.3	2	12.5	2	9.5	0	0.0	0	0.0	0	0.0
Part of all-campus LRC	1	8.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Part of university library	0	0.0	1	6.2	0	0.0	0	0.0	0	0.0	0	0.0
Not reported	0	0.0	0	0.0	0	0.0	0	0.0	1	5.9	0	0.0

than 900 square feet. The majority of the schools with an associate degree or a baccalaureate program had LRC's between 900 and 3599 square feet, while the only school with an LRC greater than 10,000 square feet offered three types of education programs.

TABLE 9. SQUARE FOOTAGE OF LRC's (N=77)

Square Feet	Number	Percent
Less than 400	3	3.9
400 - 899	3	3.9
900 - 1599	15	19.5
1600 - 2499	12	15.6
2500 - 3599	9	11.7
3600 - 4899	0	0.0
4900 - 6399	2	2.6
6400 - 9999	3	3.9
10,000 and above	1	1.3
Not reported	29	37.6

TABLE 10. LRC SIZE BY NURSING EDUCATION PROGRAM (N=77)

Size	Diploma N	Diploma %	Associate N	Associate %	Baccalaureate N	Baccalaureate %	Associate and Baccalaureate N	Associate and Baccalaureate %	Baccalaureate & Graduate N	Baccalaureate & Graduate %	Associate, Baccalaureate & Graduate N	Associate, Baccalaureate & Graduate %
Less than 400	2	16.7	1	6.2	0	0.0	0	0.0	0	0.0	0	0.0
400-899	2	16.7	1	6.2	0	0.0	0	0.0	0	0.0	0	0.0
900-1599	1	8.3	3	18.8	7	33.3	2	28.6	1	5.9	1	25.0
1600-2499	3	25.0	4	25.0	3	14.3	0	0.0	2	11.8	0	0.0
2500-3599	1	8.3	2	12.5	3	14.3	0	0.0	3	17.6	0	0.0
4900-6399	0	0.0	0	0.0	1	4.8	0	0.0	0	0.0	1	25.0
6400-9999	0	0.0	0	0.0	0	0.0	0	0.0	3	17.6	0	0.0
10,000 and above	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	25.0
Not reported	3	25.0	5	31.3	7	33.3	5	71.4	8	47.1	1	25.0

Twenty-one participants reported the number of hospital beds in their LRC. The number reported ranged from two to sixteen beds. Seventy-one participants reported the number of carrels in their LRC. The reported number of carrels ranged from 3 to 110.

LRC Personnel

The number of schools employing different types of LRC personnel is given in Table 11. Seventy percent of the schools in this sample employed an LRC director, and sixty-one percent employed students/aides. Two schools, an associate degree program and a baccalaureate program, had an LRC but had no personnel employed specifically for the LRC.

TABLE 11. NUMBER OF SCHOOLS IN WHICH TYPES OF LRC PERSONNEL ARE EMPLOYED (N=77)

LRC Personnel	Number of Schools	Percent
Director	54	70
Faculty	29	38
Secretary/clerical	22	28
Librarian	12	15
Media person/technician	28	36
Students/aides	46	61
Other	46	5

The total number of each type of LRC personnel employed full and part time in schools of nursing is given in Table 12. Fifty-nine percent of the LRC personnel were employed part time and 41 percent full time. The most frequently employed personnel were students/aides; and 99 percent of them were employed part time, or less than 20 hours per week.

TABLE 12. LRC PERSONNEL EMPLOYED FULL AND PART TIME IN SCHOOLS OF NURSING WITH AN LRC (N=77)

LRC Personnel	N	Full time Number	Full time Percent	Part time Number	Part time Percent
Director	62	54	87	8	13
Faculty	44	21	48	23	52
Secretary/clerical	28	25	89	3	11
Librarian	21	13	62	8	38
Media/technician	38	33	87	5	13
Students/aides	175	2	1	173	99
Other	5	5	100	0	0
TOTAL	373	153	41	220	59

When the number of students/aides was excluded from the analysis and only non-student LRC personnel were analyzed, the percentage of full-time LRC personnel increased to 81 percent and part-time decreased to 19 percent. It is

TABLE 13. LRC PERSONNEL EMPLOYED FULL AND PART TIME ACCORDING TO NURSING EDUCATION PROGRAMS

LRC Personnel	N	Diploma Programs (N=67) Full Time	Diploma Programs (N=67) Part Time	Associate Degree Programs (N=46) Full Time	Associate Degree Programs (N=46) Part Time	Baccalaureate Programs (N=77) Full Time	Baccalaureate Programs (N=77) Part Time	Associate Degree & Baccalaureate Programs (N=30) Full Time	Associate Degree & Baccalaureate Programs (N=30) Part Time	Baccalaureate & Graduate Programs (N=131) Full Time	Baccalaureate & Graduate Programs (N=131) Part Time	Associate Degree, Baccalaureate, & Graduate Programs (N=22) Full Time	Associate Degree, Baccalaureate, & Graduate Programs (N=22) Part Time
Director	62	6	0	9	1	10	3	7	2	16	1	6	1
Faculty	44	2	0	5	2	7	8	0	1	6	12	1	0
Secretary/ clerical	28	5	1	5	1	3	1	0	0	10	0	2	0
Librarian	21	7	0	2	4	1	1	1	3	2	0	0	0
Media/tech-nician	38	6	0	2	0	8	5	1	0	15	0	1	0
Students/ aides	175	0	40	0	15	1	29	0	14	1	65	0	10
Other	5	0	0	0	0	0	0	1	0	3	0	1	0
Total	373	26	41	23	23	30	47	10	20	53	78	11	11
		39%	61%	50%	50%	39%	61%	33%	67%	40%	60%	50%	50%

of interest to note that over 81 percent of the LRC directors, secretaries, and media persons/technicians were employed full time, while over half of the faculty employed in LRC's were part-time employees. The full- and part-time LRC personnel according to type(s) of nursing education program offered in the schools are shown in Table 13. Of the 175 students/aides employed within the schools, over one-third were employed in schools with baccalaureate and graduate programs. Once again, it is noted that the employment of part-time students/aides contributed to a high percentage of part-time LRC employees in each of the nursing educational programs.

Learning Activities

The conference participants were asked to identify the types of learning activities available in the LRC. Nine types were identified as occurring in schools of nursing. The number of schools in which various types of LRC activities are reported to occur is shown in Table 14. Self-learning and skills learning were the two learning activities which occurred in the LRC in the greatest number of schools of nursing. Computer-assisted instruction occurred in the LRC in seven schools of nursing.

TABLE 14. NUMBER OF SCHOOLS OF NURSING WHICH REPORTED THE AVAILABILITY OF LRC ACTIVITIES BY TYPE OF ACTIVITY (N=77)

Activities	Number of Schools	Percent
Self-learning	65	84.4
Skills learning	60	77.9
Quiet study	56	72.7
Simulated patients	50	64.9
Reference materials	49	63.6
Group work	44	57.1
Reading area	37	48.0
Computer-assisted instruction	7	9.1
Faculty demonstrations	2	2.6

Services

The number of schools of nursing in which LRC services are reported to occur is given in Table 15. The service which occurred in the greatest number of schools was AV preview. No participating school reported the offering of computer-managed instruction. It is of interest to note that fifty-six of the seventy-seven schools reported having media production services in the LRC.

TABLE 15. NUMBER OF SCHOOLS OF NURSING WHICH REPORTED THE AVAILABILITY OF LRC SERVICES BY TYPE OF SERVICE (N=77)

Services	Number of Schools	Percent
AV preview	61	79.2
AV purchase	59	76.6
Cataloging	58	75.3
Media production	56	72.7
Equipment delivery	49	63.6
Distribution AV equipment	48	62.3
Tutorial aid	35	45.4
Photocopying	23	29.9
Research service	14	18.2
Test analysis	14	18.2
Maintenance	13	16.9
Evaluation student performance	5	6.5
Instruction in operating equipment	4	5.2
Storage	2	2.6
AV duplication	1	1.3
Computer-managed instruction	0	0.0

Users

The participants were asked to list the types of students utilizing the LRC. The number of schools reporting is shown in Table 16. The majority (90%) of the LRC's was used only by students in nursing. Only one school's LRC was reported to be available for use by the general public, while five schools opened their LRC's to professionals in the community. Almost one-fourth of the LRC's was also used by students of the allied and other health sciences.

TABLE 16. NUMBER OF SCHOOLS OF NURSING WHICH REPORTED TYPES OF LRC USERS (N=77)

Users	Number of Schools	Percent
Nursing students only	69	89.6
Allied health students	18	23.4
Medical students	5	6.5
Professionals in community	5	6.5
All-campus students	3	3.9
Hospital personnel	3	3.9
General public	1	1.3

PLAN TO ENHANCE LRC UTILIZATION

All conference participants were asked to develop a plan to enhance the utilization of their LRC during the subsequent six months (See Appendix B for form). They were asked to: 1) identify a problem or need that they would like to resolve/meet in the next six months, 2) describe the state of affairs (what the problem/need was like at that particular time), 3) propose objectives in measurable terms, 4) identify activities that they intended to undertake to achieve the objectives identified, and 5) describe the resources that they might use to help them accomplish the objectives.

Conference time was allocated for the participants to develop their individual Plan to Enhance LRC Utilization. Each attendee's final Plan was prepared in duplicate: one copy was to be returned at the end of the conference and the other copy was given to the participant to be used when completing the Progress Reports in six months.

Of the 136 conference participants, 89 returned a Plan to Enhance LRC Utilization. A content analysis of the Plans was conducted according to frequency and type of problem identified, number of objectives for each problem, and the number and types of activities and resources listed.

Problems

The problems listed on the Plans were grouped under ten categories, which were: 1) goals, functions, philosophy; 2) faculty; 3) facilities, milieu, personnel; 4) services; 5) equipment; 6) materials; 7) operations; 8) evaluation; 9) establishing an LRC; and 10) need for knowledge. A response to the problem or need item on the Plan was assigned to a particular problem category based on the information given in the problem or need section of the form and in the state of affairs section. The state of affairs section helped to clarify the nature of the problem/need. These two sections were considered together when categorizing the problems. Any number of problems could be listed on the form.

A total number of 122 problems was identified on the 89 Plans that were returned. The number of problems identified by an individual conference participant ranged from one to five. The frequency distribution of the 122 problems according to categories is listed in Table 17. The most frequently cited type of problem was related to faculty (N=31). This category included such problems as the need to increase faculty involvement in the LRC, need to increase faculty awareness of LRC policies and procedures, need for faculty development programs regarding LRC, and the lack of faculty incentive to use the LRC. Problems in this category comprised 25.4% of all the problems identified.

There were three categories that each had the same number of problems listed (N=16 problems each). These categories related to services, establishing an LRC, and facilities, milieu, and personnel. Service problems included such things as lack of a centralized inventory of equipment and/or materials, lack of a central location of learning resources, lack of a system for cataloging materials, and lack of communication of holdings/services to faculty and/or students.

Specific problems categorized under establishing an LRC included justifying a need for an LRC, doing the initial ground work in planning one, designing an LRC, seeking funds to support an LRC, and gaining acceptance of the college of nursing for released time to plan the development of an LRC.

Examples of problems in the category of facilities, milieu, and personnel included inadequate space, facilities not conducive to learning, inadequate number of personnel, staffing not satisfactory, and need for more and better trained personnel.

The number of problems in the four categories of faculty (25.4%), services (13.1%), establishing an LRC (13.1%), and facilities, milieu and personnel (13.1%) comprised 64.7% of the total problems listed on the Plans.

TABLE 17. PROBLEMS/NEEDS (N=122)

Problems	Number	Percent
Faculty	31	25.4
Establishing an LRC	16	13.1
Facilities, milieu, personnel	16	13.1
Services	16	13.1
Evaluation	12	9.8
Goals, functions, philosophy	12	9.8
Materials	8	6.6
Operations	6	4.9
Equipment	3	2.5
Need knowledge	2	1.6

Objectives

Of the 89 Plans that were returned, a total of 171 objectives was identified for the 122 problems. The frequency distribution of the number of objectives according to the type of problem to which they related is given in Table 18. The greatest number of objectives (N=58) was identified for the problem category of faculty, the second most frequent number of objectives (N=28) was identified for establishing an LRC, and the third (N=13) for the problem category of services. These three problem areas accounted for 63.1% of all the objectives listed.

TABLE 18. TYPES AND NUMBERS OF LRC PROBLEMS AND RELATED OBJECTIVES

	Types of Problems (N=122)		Related Objectives (N=171)	
	Number	Percent	Number	Percent
Faculty	31	25.4	58	33.9
Establishing an LRC	16	13.1	28	16.4
Facilities, milieu, personnel	16	13.1	12	7.0
Services	16	13.1	23	13.4
Evaluation	12	9.8	17	9.9
Goals, functions, philosophy	12	9.8	15	8.8
Materials	8	6.6	8	4.7
Operations	6	4.9	7	4.1
Equipment	3	2.5	2	1.2
Need knowledge	2	1.6	1	.6

Activities Planned

A total of 247 proposed activities was listed on the Plan to Enhance LRC Utilization. These were the activities that the respondents intended to do to achieve the objectives identified on the Plan. The frequency distribution of these activities is given in Table 19 in rank order. The activity categories were developed from the types of activities the participants listed on the form. Since one activity may help achieve more than one of the objectives, no attempt was made to cross reference the activities according to a related objective or problem.

The most frequently cited proposed activity (N=63) was that of gaining knowledge/input/experiences from others through personal contact including other faculty members, faculty committees, administrative personnel, campus personnel, students, LRC personnel, and so forth. The next most frequent type of activity was related to evaluation. This category included activities such as conducting studies, doing surveys, and collecting data including the development of data gathering instruments. The third most frequent activity listed

was that of informing faculty about such things as policies, what's available, writing a booklet describing the LRC, and conducting faculty orientations to the LRC. The fourth most frequent category of activity was the writing/rewriting of LRC operational documents. This category included the writing of an LRC philosophy, defining the LRC role, writing objectives for the LRC, writing policies and procedures, and developing job descriptions and criteria for selection of LRC personnel.

TABLE 19. RANK ORDER OF PROPOSED ACTIVITIES

Activities	Number	Percent
Seek input from others	63	25.5
Evaluate/conduct study/collect data	31	12.6
Inform/communicate faculty/students	31	12.6
Write/rewrite operational documents	22	8.9
Organize/inventory/catalog software	19	7.7
Gain factual knowledge	14	5.7
Plan for an LRC including sources of funding	13	5.3
Formal faculty development programs	11	4.5
Select/locate/produce media/modules	9	3.6
Develop a record keeping form/system	7	2.8
Provide/expand/revise services/teaching methods	7	2.8
Request additional/employ personnel	7	2.8
Expand/reorganize/renovate space	6	2.4
Integrate LRC with curriculum	4	1.6
Purchase equipment	3	1.2
Total	247	

Resources

The 89 respondents were asked to describe the resources that they might use to help them accomplish the objectives of the Plan to Enhance LRC Utilization. A total of 207 was identified. These resources were categorized under people, physical, money, and time. The people and physical categories were further divided into subcategories. The frequency distribution of the number and types of resources listed on the Plans is in Table 20. Over 64% or 133 of the 207 resources described were people resources. Within the category of people, the most frequently mentioned resource was faculty. Physical resources comprised 31% or 64 of the 207 resources. Within the physical resources, the most frequently mentioned subcategory was materials.

TABLE 20. TYPES OF RESOURCES MENTIONED

Resources	Number	Percent
People		
Faculty	37	17.9
Campus resource people	22	10.6
LRC conference resource people	16	7.7
LRC personnel	16	7.7
Students in school or course (non-employees)	15	7.3
Dean/director of school of nursing	14	6.8
Consultants from off-campus organizations	9	4.3
Student assistants in LRC (employees)	4	1.9
Subtotal	133	64.2
Physical		
Materials (course materials, notes from conference, software, current holdings)	19	9.2
Literature	13	6.3
Existing forms, records, reports	12	5.8
Space/facilities	8	3.9
Other college/university resources	8	3.9
Equipment on hand	4	1.9
Subtotal	64	31.0
Money	9	4.3
Time	1	.5
Total	207	

Discussion

The overall problem/need that was most frequently identified on the Plan was faculty. For some individuals, the problem of establishing an LRC was a major concern while for others, probably those with established LRC's, there were concerns about the rendering of services and having facilities conducive

to and personnel supportive of learning activities in the LRC. The types and numbers of objectives that were identified were proportionately related to the types and numbers of problems; therefore it did appear that the participants were planning to address the problems identified. In terms of the types of activities that were proposed to achieve the objectives, more of them were directed toward improving communication, i.e., seeking input from others, gaining factual knowledge, communicating with faculty and students, and collecting data, rather than dealing with physical things such as purchasing equipment or reorganizing the space.

The participants planned to use people resources more than they did physical resources. The participants identified the human resources they had at their own institutions in the form of their own faculty and other campus resource people. It is of interest to note that participants proposed to use the LRC conference resource people as frequently as they intended use their own LRC personnel.

PROGRESS REPORTS

All participants who completed a Plan to Enhance LRC Utilization were asked to submit a Progress Report for each of the objectives identified on their Plan, six months after the conference. A separate Progress Report form was to be completed for each of the objectives. Three Progress Report forms were included in each conference attendee's notebook (See Appendix C for an example). The purpose of the Progress Reports was to determine the extent to which the conference participants were able to achieve, during the six months following the conference, the Plans they had identified at the conference. A follow-up letter was sent to all the participants to remind them about returning their Progress Reports.

Of the 89 conference participants who submitted a Plan to Enhance LRC Utilization at the end of the Conference, 12 of the individuals had changed positions since the LRC Conference and declined to return the Progress Reports as the Plans were no longer appropriate for their situations. Forty-two or 54.5% of the 77 remaining participants returned at least one Progress Report and reported their progress on a total of 68 objectives. The 68 objectives were first examined for their consistency with the original objectives stated on the individual Plans written at the conference. Table 21 indicates the extent to which the objectives on the Progress Reports were consistent with the problems listed on the Plans.

TABLE 21. CONSISTENCY OF OBJECTIVES ON PROGRESS REPORTS WITH OBJECTIVES ON PLAN (N=68)

Consistency	Number
Same as original	53
Combined objectives but still related to problem	7
Totally new or an additional objective	7
Modified slightly but related to the problem	1

Table 21 indicates that 61 (89%) of the objectives were the same as, related to, or a combination of the original objectives. Seven of the objectives were new ones.

The types of LRC problems that were addressed within the 68 objectives are given in Table 22. Additionally, the number of objectives stated on the Plans were compared to the number of objectives stated on the Progress Reports according to types of problems addressed. Data in Table 22 reflect that the objectives on the Progress Reports addressed similar problems to those on the original Plans. The three types of problems addressed by the objectives most frequently on the Plans were faculty, establishing an LRC, and services, in that order, while on the Progress Reports the three most frequently mentioned problems were, in order, faculty, services, and evaluation. Of the three most frequently occurring problems addressed by the objectives, faculty and services appeared on both the Plans and Progress Reports.

TABLE 22. OBJECTIVES ON PLANS AND PROGRESS REPORTS ACCORDING TO TYPES OF PROBLEMS

Problems	Plans (N=171)		Progress Reports (N=68)	
	Number	Percent	Number	Percent
Faculty	58	33.9	23	33.8
Establishing an LRC	28	16.4	4	5.9
Services	23	13.4	12	17.6
Evaluation	17	9.9	9	13.2
Goals, functions, philosophy	15	8.8	5	7.4
Facilities, milieu, personnel	12	7.0	7	10.3
Materials	8	4.7	1	1.5
Operations	7	4.1	6	8.8
Equipment	2	1.2	1	1.5
Need knowledge	1	.6	-	--

The sample of objectives listed on the Progress Reports was a fair representation of the original objectives with respect to the types of LRC problems being addressed.

The number and types of activities reported on the Progress Reports were analyzed. A total of 115 activities were reported by 42 individuals on the Progress Reports whereas a total of 247 activities had originally been identified by 89 individuals on the Plans. However, since these data were taken from two different populations, further comparison of this information is limited.

The activities that the individuals undertook to achieve the objectives were categorized according to the same categories used in analyzing the Plans. The frequencies of the activities are shown in Table 23 in rank order. Table 23 also shows how the rank order of the frequencies of the proposed activities compared to the rank order of the frequencies of the activities reported on the Progress Reports.

TABLE 23. RANK ORDER OF FREQUENCIES OF ACTIVITIES ON PLANS AND PROGRESS REPORTS

Plans	Number	Percent	Progress Reports	Number	Percent
Seek input from others	63	25.5	Seek input from others	47	40.8
Inform/communicate	31	12.6	Inform/communicate	13	11.3
Evaluate/conduct study/ collect data	31	12.6	Gain factual knowledge	10	8.7
Write/rewrite operational documents	22	8.9	Evaluate/conduct study/collect data	9	7.8
Organize/inventory/ catalog software	19	7.7	Organize/inventory/ catalog software	7	6.1
Gain factual knowledge	14	5.7	Write/rewrite operational documents	6	5.2
Plan for an LRC	13	5.3	Select/locate/produce media/modules	6	5.2
Formal faculty development programs	11	4.5	Integrate LRC w/ curriculum	5	4.3
Select/locate/produce media/modules	9	3.6	Employ personnel	4	3.5
Develop record keeping system	7	2.8	Formal faculty development programs	3	2.6
Employ personnel	7	2.8	Develop record keeping system	1	.9
Provide/expand/revise services/teaching methods	7	2.8	Provide/expand/revise services/teaching methods	1	.9
Space	6	2.4	Space	1	.9
Integrate LRC w/curriculum	4	1.6	Plan for an LRC	1	.9
Purchase equipment	3	1.2	Purchase equipment	1	.9
Total	247			115	

TABLE 24. TYPES OF RESOURCES UTILIZED

Resources	Number	Percent
People		
LRC personnel	30	21.7
Faculty	25	18.1
Dean/director of school of nursing	9	6.5
Campus resource people	5	3.6
Consultants from off-campus organizations	5	3.6
LRC conference resource people	5	3.6
Student assistants in LRC (employees)	2	1.4
Students in school or course (non-employees)	2	1.5
Subtotal	83	60.0
Physical		
Materials (course materials, notes from conference, software, current holdings)	19	13.8
Existing forms, records, reports	11	8.0
Literature	8	5.8
Other college/university resources	5	3.6
Space/facilities	3	2.2
Equipment on hand	2	1.5
Subtotal	48	34.9
Time	4	2.9
Money	3	2.2
Total	138	

TABLE 25. COMPARISON OF RESOURCES ON PLANS AND PROGRESS REPORTS

Resources	Plans (N=207) Number	Plans (N=207) Percent	Progress Reports (N=138) Number	Progress Reports (N=138) Percent
People				
Faculty	37	17.9	25	18.1
Campus resource people	22	10.6	5	3.6
LRC conference resource people	16	7.7	5	3.6
LRC personnel	16	7.7	30	21.7
Students in school or course (non-employees)	15	7.3	2	1.5
Dean/director of school of nursing	14	6.8	9	6.5
Consultants from off-campus organizations	9	4.3	5	3.6
Student assistants in LRC (employees)	4	1.9	2	1.4
Subtotal	133	64.2	83	60.0
Physical				
Materials (course materials, notes from conference, software, current holdings)	19	9.2	19	13.8
Literature	13	6.3	8	5.8
Existing forms, records, reports	12	5.8	11	8.0
Space/facilities	8	3.9	3	2.2
Other college/university resources	8	3.9	5	3.6
Equipment on hand	4	1.9	2	1.5
Subtotal	64	31.0	48	34.9
Money	9	4.3	3	2.2
Time	1	.5	4	2.9

It is of interest to note that the percentage of activities relating to the seeking of input from others increased on the Progress Reports. Evidently, the activity of obtaining input from others became more important during the implementation phase of the problem solving process than it did during the planning phase. Further interpretation of Table 23 is limited because of differences in sample populations from which the data are drawn.

The types of resources reported on the Progress Reports were categorized under the same headings as they were on the Plans. The frequencies and percentages of the resources utilized are given in Table 24 while Table 25 compares the resources proposed (on the Plans) to those used (on the Progress Reports). Although the two types of resources are based on different sample populations, the percentages of the proposed and actual use of people and physical resources are approximately the same. However, within the categories there are some slight changes. It appears that conference participants utilized the resources of the LRC staff more and the students, campus resource people, and LRC conference people less than they had planned to do. Although the use of faculty as a resource was most frequently listed on the Plans, the actual use of faculty, while still high in frequency, became the second most frequently mentioned resource on the Progress Reports. Faculty were used less frequently as a resource than were the LRC personnel to help achieve the objectives listed on the Plans.

Each of the 68 objectives on the Progress Reports was examined to determine the level of progress the participant had been able to achieve during the six months following the conference. In order to assess progress, four levels of achievement were identified. They were: 1) awareness, 2) interest, 3) participation, and 4) affirmation. The forms were examined for information that gave evidence of the level of achievement for each objective. The following illustrates how the data were categorized into a level of objective achievement.

	Description of Achievement	Examples of Evidence
LEVEL 1 Awareness	Became aware of what existed or that a discrepancy existed between what was and what was ideal.	Reported that the problem exists or continues to exist; nothing much else done about it.
LEVEL 2 Interest	Sought additional information or assistance.	The occurrence of meetings with the Dean or faculty about proposed LRC changes. No further progress beyond this.
		Increased awareness of LRC resources, purpose, role among faculty and students.
		Idea shared or approved, but no subsequent action taken.
		Took a course in an LRC related area.

		Got individual faculty members to agree to assist with problem resolution.
		Correspondence with others.
LEVEL 3 Participation	Made use of information or assistance received in some way.	Got a committment for implementation of idea for next school year.
		Reported partial achievement of goal.
		Started to collect data.
		Reported more usage of hardware and software.
		Evaluation study partially implemented.
LEVEL 4 Affirmation	Incorporated (adopted) an idea, policy, procedure, or so forth on a consistent basis.	Implementation of a new procedure, record keeping system or catalog system on a routine basis.
		Reported changes in LRC personnel relationships.
		Presence or utilization of newly produced media or learning modules.
		Distribution of policy and procedure manuals.
		Establishment of an LRC faculty committee.
		Obtained funding for idea.

Table 26 indicates the number of objectives that were achieved at each of the levels of achievement. Approximately 12% of the 68 objectives addressed by 42 individuals during the six months following the conference were categorized at Level 1 awareness which indicated essentially no or little progress had been achieved. There was evidence from the analysis of the Progress Reports that the participants had achieved interest, participation, and affirmation on 88% of the objectives addressed on the Progress Reports.

TABLE 26. LEVEL OF ACHIEVEMENT FOR OBJECTIVES (N=68)

Level of Achievement	Number of Objectives	Percent
1 - Awareness	8	11.8
2 - Interest	24	35.3
3 - Participation	16	23.5
4 - Affirmation	20	29.4

DISCUSSION

The Progress Reports which were returned by 42 of the conference participants addressed 68 objectives. Sixty-one (89%) of the objectives on the Progress Reports addressed the same problems as on the original Plans. There were also similarities between the two instruments regarding the types of problems that were addressed by the objectives. The problem category of faculty was the most frequently mentioned problem on both the Plans and the Progress Reports. Also, the services category was the third most frequently mentioned problem on the Plans. However, it was the second most frequently occurring problem on the Progress Reports. Based on a comparison of the objectives on the Plans and the objectives on the Progress Reports, it appears that the 42 individuals who returned the Progress Reports at six months were a fair representation of the 89 conference participants who submitted a Plan.

Based on a comparison of the proposed activities listed on the original Plans to the activities indicated on the Progress Reports, the need to obtain input from others and to gain factual knowledge became more important during the implementation phase than it did during the planning phase. Some of the activities that were mentioned frequently in the Plans were not mentioned as frequently on the Progress Reports. The reason for this is not known although many of those activities that showed a decrease in frequency of occurrence were activities that usually take time to accomplish and thus a six months progress report may not have allowed sufficient time for some of the activities to have been undertaken or completed.

There was agreement between the types of resources mentioned on the Plans and those the participants used as reported on the Progress Reports. However, on the Progress Reports in the category of people, there was increased use of LRC personnel as a resource to help resolve/meet the objectives over that which had been indicated on the Plans.

The level of achievement on the 68 objectives for which Progress Reports were returned was relatively high. The data were not analyzed as to which types of objectives (or problems) were achieved at what level. Only the total number of objectives was classified into levels of achievement. Many of the objectives included in the affirmation level of achievement were very time-consuming and ambitious undertakings, i.e., development of 20 self-paced modules; development of a catalog of AV materials; development of an LRC

policy and procedural manual; recognition of the development of non-print media as a justification for promotion and tenure; development of a card catalog; and establishment of a Learning Resources schoolwide committee. What the individual conference participants were able to accomplish in six months was quite commendable.

SUMMARY AND CONCLUSIONS

A national conference, the first of its kind, on Learning Resources Centers associated with schools of nursing was held in December 1978. The conference was hosted by the University of Alabama School of Nursing at the University of Alabama in Birmingham. A total of 145 individuals attended the conference from various parts of the United States and Canada. All of the conference attendees, except those from the host institution, were invited to participate in a study to: 1) evaluate the short- and long-term impact of the LRC Conference and 2) describe the characteristics of the conference participants and their Learning Resources Centers.

The conference participants were asked to complete different evaluation instruments at indicated times during and following the conference. Data from three of the instruments are reported in this section. The three instruments reported here are the Participant's Profile, Plan to Enhance LRC Utilization, and Progress Reports.

The descriptive data reported on the Participant's Profile indicated that the participants represented 104 different institutions or agencies and that most of the participants were directly associated with a school of nursing. However, there were representatives from other health science schools such as pharmacy, medicine, and allied health. Most of the conference participants already had an LRC (N=118) while 18 did not have one.

The number of individuals from schools of nursing was 118, and they represented 90 different schools of nursing from different parts of the United States and Canada. Of these 90, 77 schools reported that they had an LRC and 13 reported that they did not currently have one, but planned to develop an LRC.

Participants were asked to identify the title of the person to whom they reported. It was found that seventy-nine percent of the LRC directors reported directly to the Dean of the school of nursing while ten percent reported to another type of administrator in the school of nursing.

The number of schools of nursing represented at the conference with different types of nursing education programs was: Diploma 12, Associate Degree 16, Baccalaureate 21, Associate and Baccalaureate 7, Baccalaureate and Graduate 17, Associate, Baccalaureate, and Graduate 4. There were no representatives at the conference from a nursing school that had a graduate program only.

Descriptive data about LRC's associated with a school of nursing revealed that most LRC's were located within the school of nursing building, that the most frequently reported LRC size was 900-1599 square feet, and that most schools of nursing employed an LRC director as well as students/aides. The most frequently employed personnel were students/aides; and 99 percent of them were employed part time, or less than 20 hours per week. This contributed to a high percentage of part-time LRC employees. When the number of students/aides was excluded from the analysis of full- and part-time employees, the percent of full-time LRC personnel was 76 and part-time 24. Over 87% of the LRC directors, secretaries, and media persons/technicians were employed full time while over half of the faculty in the LRC were part-time employees.

Nine types of learning activities were identified as occurring in school of nursing LRC's. The most frequent types of learning activities were self-learning and skills learning. Sixteen types of services were reported to occur in the LRC's. The four most frequently reported LRC services were AV preview, AV purchase, cataloging, and media production. Computer-assisted instruction was reported in seven schools of nursing, and no school reported the offering of computer-managed instruction. The majority of LRC's associated with schools of nursing was used only by students in nursing.

Eighty-nine conference participants returned a Plan to Enhance LRC Utilization. A content analysis of the Plan was conducted according to frequency and type of problem identified, number of objectives for each problem, and the number and types of activities and resources listed. The problems were categorized into ten problem types: 1) goals, functions, philosophy; 2) faculty, 3) facilities, milieu, personnel; 4) services, 5) equipment, 6) materials, 7) operations, 8) evaluation, 9) establishing an LRC, and 10) need for knowledge. On the 89 Plans submitted, 122 problems were identified. The most frequently cited type of problem was related to faculty. Three other types of problems that were mentioned frequently were services, establishing an LRC, and facilities, milieu, and personnel. These four problem categories comprised 65% of the total number of problems listed. The types and numbers of objectives that were identified on the Plans were proportionately related to the types and numbers of problems. Therefore, it did appear that the participants planned to address the problems they had identified on the Plans. The types of activities mentioned on the Plans were directed more toward improving communications than toward dealing with physical things. The participants planned to use people resources more than physical resources.

Six months after the conference, all participants who completed a Plan to Enhance LRC Utilization were asked to submit a Progress Report for each of the objectives identified on their Plans. Of the conference participants who submitted a Plan at the end of the conference, 12 of the individuals had changed positions since the LRC Conference and declined to return the Progress Reports because their Plans were no longer appropriate for their situations. Forty-two (fifty-four and five-tenths percent) of the seventy-seven participants returned at least one Progress Report and reported their progress on a total of sixty-eight objectives. The objectives on the Progress Reports were consistent with the objectives identified on the original Plans and addressed similar problems to those identified on the Plans. Of the three most frequently occurring problems addressed by the objectives, both "faculty" and "services" appeared on both the Plans and Progress Reports. It appeared that the 42 individuals who returned the Progress Reports at six months were a fair representation of the 89 conference participants who submitted a Plan at the end of the conference.

Based on a comparison of the proposed activities (on the Plans) and the activities that were undertaken (as indicated on the Progress Reports), the need to obtain input from others and to gain factual knowledge became more important during the implementation phase of the problem solving process than it did during the planning phase. There was agreement between the types of resources the participants planned to use and those they reported they had used. People resources were used more frequently than physical resources, money, or time. Within the people category, there was an increased use of LRC personnel as a resource to help resolve/meet the objectives over that which had been indicated on the Plans.

Each of the 68 objectives on the Progress Reports was examined to determine the level of progress the participants had been able to achieve during

the six months following the conference. Four levels of achievement were identified: awareness, interest, participation, and affirmation. There was evidence from the analysis of the Progress Reports that the participants had made progress on 88% of the objectives addressed on the Progress Reports. The data were not analyzed as to which types of objectives (or problems) were achieved at what level. Only the total number of objectives was classified into levels of achievement. Many of those objectives included in the affirmation level of achievement were very time-consuming and ambitious undertakings. What the conference participants were able to accomplish in six months was quite commendable.

FUTURE DIRECTIONS OF THESE LRC's

Despite the fact that attempts were made during and following the LRC conference to measure the short- and long-range impact of the conference, the real impact of the conference can never be truly measured. However, in order to gain insight into the future directions of these LRC's and the people associated with them, it is first necessary to take a look at the conference participants in terms of where the persons came from and where they seem to be going. Because this was the first conference of its kind, many of the participants came to the conference not knowing each other nor what was happening in other LRC's in schools of nursing. For some of the participants, it was the first time they had ever had a chance to talk with somebody who was either experiencing the same types of LRC problems that they were or to somebody who had more experience in managing and operating an LRC. Often, the number of LRC personnel within an LRC is so small, that these individuals feel isolated in terms of being able to communicate with someone about their particular LRC problems. Hopefully, one of the benefits of this conference is that individuals with similar LRC interests will continue to communicate with each other and that the contacts and communication between the conference participants will develop into an inter-LRC personnel support system. The establishment of this communication link is very important.

It is hoped that the learning opportunities provided at the conference will inspire those in attendance to continue to improve their LRC's and enhance utilization. The evidence submitted to date indicates that the participants have made progress in identifying specific aspects of their LRC's that need strengthening and have made commendable strides in working toward resolution of their problems. Hopefully, they will continue to work on these problems in the future and to resolve discrepancies between what is and what should be.

Based on the number of people who attended the conference, who had an LRC, and who planned to develop one, the trend towards the use of LRC's in schools of nursing is growing. However, administrators, faculty, and LRC personnel will need to address some of the problems identified in this monograph if LRC's are to continue to survive. Specifically, there is the need to address the problems of faculty, services, and evaluation including learning and cost effectiveness. How does one get the faculty involved with the LRC? What services can and should the LRC provide? What resources are available to support the LRC and how should they be utilized? How cost effective is an LRC? As money gets tighter there will be an increased need to justify LRC's existence not only in terms of services rendered but also in terms of cost and learning effectiveness. Providing cost effective learning services in the future appears to be a challenge that all LRC's will need to face.

RECOMMENDATIONS

Based on the proceedings of the first LRC Conference and the data collected during and after the conference, the following recommendations are made:

1. That the individual conference participants continue to implement their Plan to Enhance LRC Utilization.

2. That additional LRC conferences be held either at the state, regional, or national level for administrators, faculty, and LRC personnel associated with LRC's in schools of nursing.

3. That future LRC conferences again address strategies that can be used in resolution of LRC problems.

4. That data be collected in all future LRC conferences.

5. That opportunities be provided for faculty development programs specific to LRC's.

6. That efforts be made to support greater faculty involvement with LRC's.

7. That schools of nursing continue to explore ways of integrating their LRC's with the curriculum.

8. That future research be conducted in the area of LRC's, especially in the areas of learning and cost effectiveness.

APPENDICES

APPENDIX A

Participant's Profile

Code No._____

UNIVERSITY OF ALABAMA SCHOOL OF NURSING
UNIVERSITY OF ALABAMA IN BIRMINGHAM

Learning Resources Center Conference

PARTICIPANT'S PROFILE

Profile of: _____ Title _____

Address: _____

_____

1. Does your institution/agency have a Learning Resources Center OR plan to develop one? Yes ____ No ____

If YES, continue to Question 2.
If NO, skip to Question 7.

2. What is your primary relation to your LRC:
   _____ Dean/Director of School of Nursing
   _____ Director/Coordinator of LRC
   _____ Faculty Member
   _____ LRC Personnel
   _____ Other — please specify_____

3. What is the title of the person to whom you report?_____

4. Please indicate the number of students currently enrolled in each level of curriculum in your nursing program:
   _____ Diploma _____ Baccalaureate _____ Other (please specify)_____
   _____ Associate _____ Graduate _____

5. Number of School of Nursing faculty full time_____ part time_____.

If you do not currently have a LRC, but are planning one, please skip to question 7.

6. Briefly describe your LRC according to the following characteristics:

   a. LRC Location (e. g. within School of Nursing building; as part of an all campus LRC; as part of the University Library, etc.):

   b. LRC Size (e.g. 20' x 30', single room with 10 study carrels):

   c. LRC Personnel

Title	Number	Hours/Week in LRC

   d. Types of Learning Activities and Services available within your LRC. Please be as specific as possible.
      (1) Learning activities (e. g. quiet study; skills learning; group work; self-instructional learning materials; reading area; reference materials; simulated patients; computer assisted instruction, etc.):

      (2) Services rendered by the LRC staff (e. g. cataloging, xeroxing, test analysis, tutorial aid, media production, equipment delivery to classroom, research services, AV preview, AV purchase, distribution of AV equipment, etc.):

   e. Types of students utilizing LRC services (e.g. all health science, medical only, nursing only, etc.):

7. My reason for coming to this conference was:

(Use back sheet if more space is needed for response)

APPENDIX B

Plan to Enhance LRC Utilization

FOR
Small Group Sessions
Monday 11:00–12:00
3:00– 4:00
Tuesday 11:30–12:00

Code No._____

PLEASE COMPLETE
BY
NOON ON TUESDAY

UNIVERSITY OF ALABAMA SCHOOL OF NURSING
UNIVERSITY OF ALABAMA IN BIRMINGHAM

Learning Resources Center Conference

PLAN TO ENHANCE LRC UTILIZATION

DIRECTIONS: By responding to each of the items below, develop a plan to enhance the utilization of your LRC during the next six months.

PROBLEM OR NEED (Identify a LRC problem or need you would like to resolve/meet in the next six months.)

STATE OF AFFAIRS (Describe what the problem/need is like at this particular time.)

PROPOSED OBJECTIVES (State in measurable behavioral terms what you hope to accomplish in the next six months.)

PROPOSED ACTIVITIES (Describe what is intended to be done to achieve each objective listed above.)

RESOURCES (Describe what resources you might use to help you accomplish each objective listed above.)

December, 1978

APPENDIX C

Progress Report

DIRECTIONS:
Please complete one page for EACH of your objectives. Use back of page or attach additional pages if needed.

UNIVERSITY OF ALABAMA SCHOOL OF NURSING
UNIVERSITY OF ALABAMA IN BIRMINGHAM

Code No._____

Learning Resources Center Conference

PROGRESS REPORT

Your original objective: (Please copy in this space one of the original objectives from your "PLAN TO ENHANCE LRC UTILIZATION" form.)

Has this objective changed? Yes____ No ____
If so, please restate new objective here:

ACTIVITIES	RESOURCES	DOCUMENTATION/ EVIDENCE	UNINTENDED OUTCOME(S)	FACILITATORS	DIFFICULTIES
Describe what was done to achieve this objective:	Describe what resources you used to achieve this objective:	Describe what evidence (outcomes) you have to document the accomplishment of the objective:	Describe what unintended outcomes emerged:	Describe what facilitated your achievement of this objective:	Describe what difficulties you encountered in attempting to achieve this objective:

APPENDIX D

Participants by State and Geographic Region

PARTICIPANTS BY STATE AND GEOGRAPHIC REGION

United States	State	Number
NEW ENGLAND:	Connecticut	1
	Maine	0
	Massachusetts	7
	New Hampshire	0
	Rhode Island	0
	Vermont	0
MIDDLE ATLANTIC:	New Jersey	2
	New York	3
	Pennsylvania	6
EAST NORTH CENTRAL:	Illinois	5
	Indiana	5
	Michigan	3
	Ohio	4
	Wisconsin	3
WEST NORTH CENTRAL:	Iowa	0
	Kansas	1
	Minnesota	2
	Missouri	2
	Nebraska	1
	North Dakota	2
	South Dakota	0
SOUTH ATLANTIC:	Delaware	2
	District of Columbia	3
	Florida	11
	Georgia	5
	Maryland	0
	North Carolina	11
	South Carolina	6
	Virginia	1
	West Virginia	1
EAST SOUTH CENTRAL:	Alabama	8
	Kentucky	4
	Mississippi	7
	Tennessee	0
WEST SOUTH CENTRAL:	Arkansas	0
	Louisiana	5
	Oklahoma	1
	Texas	8

United States	State	Number
MOUNTAIN:	Arizona	4
	Colorado	1
	Idaho	0
	Montana	0
	Nevada	0
	New Mexico	2
	Utah	1
	Wyoming	0
PACIFIC:	Alaska	0
	California	2
	Hawaii	0
	Oregon	2
	Washington	2
Canada	Province	
	Alberta	2

*U.S. GOVERNMENT PRINTING OFFICE : 1980 O-311-201/3094