Planning For Media Within University Library Buildings

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"Any teacher who can be replaced by a machine, should be." B. F. Skinner (Harvard University).

"Our aim is to have the computer instruct the researcher in how stored information is organized. He is led to browse in the general area of his inquiry and broaden or narrow it as he wishes. The [computer-based] system also helps him choose the best search strategy." Donald Hillman (Lehigh University).

"The dial-access retrieval system interconnects the library listening facilities with the thirty-two listening posts of the Office Practices Laboratory and forty positions of the Foreign Language Laboratory. Eighty-six students can listen at one time to any one of the selected programs over the earphones. . . . The library and all other instructional buildings are connected with the television studio by coaxial cables." Michael N. Slama (Ventura [California] County Junior College).

"Features of the library include an electronic operations system for automated circulation, teaching machines, computer and teletype consoles, and closed-circuit television. . . . The Mart Library also provides quarters for the Interdisciplinary Center for Information Science and will be central to the continuing growth of engineering and science education and research at Lehigh." Dedication brochure for the Mart Science and Engineering Library, Lehigh University.

"No surveys can be found that indicated how much the audiovisual materials are being used by our college students. Nor is there an easy way to arrive at even a guess as to the amount of use of visual materials on the college campus. There has been millions of dollars worth of research on the potential of audiovisual materials but there seems to be no research on their actual use." Richard Chapin (Michigan State University).

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"The day when reading will be a primary form of information intake is . . . passing—my advice is to plan no more buildings for library use. Library space is a concession to the past." Sol Cornberg.

As yet, no simple formulae or prescriptions exist which can be described honestly as "definitive" guides useful to those interested in designing facilities for production, storage, or use of communications media on the university campus. In his 1965 book on Planning Academic and Research Library Buildings Keyes Metcalf sensibly devoted just two pages out of some four hundred or more to audio-visual service areas. And, even here, the general advice given was not to accept responsibility for planning such units. Why?—To Metcalf the future must have appeared uncertain. And no wonder—witness the six statements quoted above. So then, given a desire to accept library planning responsibility, statements such as the half-dozen cited illustrate dramatically the numerous dilemmas which must be faced, and the fact is that one can no longer plan library buildings simply in terms of types of space to be allocated for traditional media acquisition, storage and use. Rather the approach which is required calls for design of a total system of communication and information service, many ramifications of which suggest that library buildings as such are, indeed, passé—not that many universities have as yet been willing to accept the advice offered by Cornberg. But perhaps this is because there has not yet (as Chapin suggests) been sufficient experience in using the newer media at such new learning center and laboratory facilities as are represented, for example, at Grand Valley in Michigan, in the Marywood College Library in Scranton, Pennsylvania, at Oklahoma Christian University, and in more recent years by the New York State University system (for example at Buffalo and Geneseo). Each of these institutions has facilities which feature electronic learning carrels and other hardware manifestations of modern learning techniques and technology. How then should the library planner proceed?

In the author's opinion, the best place to begin planning for new media is by getting answers to some fundamental questions of purpose (as enunciated by institutional size, age, avowed goals and methodologies of instruction) and to questions concerning levels of teaching and research to be served as well as clear delineations of library responsibility (such as will it provide independently or in co-
Planning for Media Within University Library Buildings

operation with other agencies and departments prerequisite instructional and study spaces, equipment and special media service). Treatment of such factors tends either to be missing in much recent writing on the subject or to be notably ambiguous.

Next, library planners must acknowledge as a likelihood that it may be less necessary in the future to house all parts of any given media service program in one place so long as all units composing the program can be linked together in network-like systems and the resources of each can be deployed where and when needed to support over-all functions. That is—libraries of the future may not wisely be conceived as buildings at all but rather as parts of far-flung networks made up of units of varying sizes and types, each of which performs similar as well as some different functions, but all of which may be linked together electro-mechanically. Within the total system at one time can be vestiges of past service programs of interest both to bibliophiles and antiquarians and avant-garde approaches to use of communications technology which could include telefacsimile and high-speed voice transmission aids capable of sending and receiving over 1,000 words per minute; electronic carrels distinguished by their typewriter-like keyboards and connections to on-line, time-sharing computers; audio jacks and sets of earphones; individual television display units capable of being augmented electronically through use of light pens, etc.

Apropos of these points, the student of contemporary library and information system design must acquire a new and, perhaps for some individuals, an alien vocabulary (but hopefully buttressed by personal experience with examples of the technology to which new labels refer) covering a broad variety of new electronic handwriting devices and ranging from Touch Tone dial systems to WATS (Wide Area Telephone Service) line service, TELPAK, and CCSA (Common Control Switching Arrangements); amplified telephone systems such as the so-called "Tele-lecture"; passive audio devices (such as "Code-a-phone"); visual transmission by audio phone lines; DAIRS (dial-access information retrieval systems); the various new forms of TWX service; and the latest generation of computers (known as "third generation") which features a time-sharing, multi-programming facility. Also to be considered as part of any long-range projection is Bell Telephone's new "Picturephone" system which offers two-way voice and picture communication transmitted over present telephone lines. It should become operational before the mid-1970's.2
The balance of this article concentrates on a few of the primary factors and functions which must be considered in planning facilities for all types of university library service and tries to state simply some of the more difficult problems in planning library space arrangements for the use of modern media. Noted in passing will be references to a number of sources of relevant information and to experimental programs conducted by several universities.

Listed below are some basic matters to be considered in planning an academic library. Concerning professional responsibility, it seems clear that university libraries of the future will be responsible for providing a very broad range of educational communication and information media and for producing new instructional aids as well as distributing materials. Media evaluation (as distinguished from simple cataloging and bibliographic description) will be needed. Active partnership in instruction (as the "library-college" idea suggests) has major implications for design of library facilities. Regular participation in research concerned with the effectiveness of using new teaching-study-learning resources implies new roles for librarians. Switching center functions to provide access to information wherever it may be located physically, as distinguished from access only to materials housed within given buildings, also opens up the world of computer applications to libraries and librarians.

At a minimum, augmenting the existing inventory of traditional library resources published in printed formats will be at least four types of new media for which library space must be reserved and equipment provided. These include audio-visual materials (e.g., slides, filmstrips, motion pictures, phonograph, disc and tape recordings); the products of reprography (the relatively rapidly produced, convenient and inexpensive media used for exact duplication of graphical representations); miniaturized materials and equipment needed to use such material (some late developments permit direct transfer of material in microform to computer printout); and the products of automation (perhaps the most dramatic and visible of which are the cathode ray tube display image).

Provision of these media and, indeed, of all library resources must be accomplished in an environment which reflects the current trends in education. Three important manifestations of these trends are evident in 1) the encouragement of independent study by students (utilizing aids to programmed learning); 2) academic integration (represented in a growing number of interdisciplinary instructional
programs) and 3) use of special techniques of instruction representing in many cases what Dupuy has called the "audio-tutorial" methodologies—in essence, simple extensions to other fields of the "language laboratory" idea. Use of these methodologies may be complemented by individual student and small group work with instructors or tutors who serve in advisory roles and explain, interpret, or expand upon formal presentations given in audio or visual media. The effective teacher does not simply pass along facts and information—this can often be done more efficiently by a machine, audio tape, film, slides, or a book. In recognition of this fact, the planner of modern library service will arrange the "library" programs conceived to accommodate a growing roster of library media service functions and take into account the stress now being given to methods of instruction which feature individualized approaches. The result may be a facility which through adequate design and the nature of resources provided can facilitate individualized study and teaching methods and deliver conveniently (virtually on demand, using electro-mechanical aids and systems) whatever types of new media service may be required to pursue given individual (or group) instructional objectives.

The management of such facilities requires close cooperation and joint planning by teams of specialists, all of whom are concerned, however, with the educational process and which may include as individual members some whose primary tasks will be represented in the work of advising students, others in testing, producing and/or distributing materials. Of note in this regard is the work being done in the new learning centers established at Stephens College in Missouri, at Oklahoma Christian College and Oral Roberts University. Other centers with similar goals have been established recently on the Santa Cruz campus of the University of California, by the University of Illinois on its Chicago campus, and in Florida at Florida Atlantic and at the University of South Florida. Orchard Ridge campus, one of three maintained by the Oakland Community College (located in the suburbs of Detroit), may represent the first complete campus designed specifically for individually-paced learning programs based on very heavy utilization of multi-media. Those responsible for planning libraries are urged to take cognizance of experience already gained at such institutions as those named.

Mandates given those responsible for constructing new college or university library buildings usually state that what must be provided
is "maximum flexibility," "loft" space with a floor and/or ceiling "power grid" and, where feasible, "instantaneous access" to all specialized materials and equipment needed to assist the teaching-learning-study process.

Nor are such mandates, however vague, without merit. Contemporary thinking about university buildings and facilities suggests that any given instructional department, research laboratory, or library unit cannot be expected to remain in one physical form much longer than five years. Hence, the new Forbes Area complex of buildings being planned for the University of Pittsburgh (which is to house the humanities and social science departments as well as several professional schools) has been conceived and approved for construction as a modular, highly flexible unit capable of extension and virtually infinite rearrangement simply by changing wall, ceiling or floor locations much as one might restack boxes to permit larger, then smaller, and then again larger space utilization in three dimensions.

In the case of televised instruction, the experiences reported by Michigan State University indicate that, given the present state of the art in design and use of closed-circuit television systems, the major expense to be associated with televised instruction involves staffing costs. Of course, size of enrollment is also a major factor. But in any event, until higher education is able to redeploy significantly its instructional staffs and related resources (e.g., space, equipment, and materials), very large courses enrolling as many as five hundred individuals will be needed frequently to reach a fiscal "break even" point.

One useful review of budget considerations is represented in the three-volume study entitled *Costs of Educational Media Systems,* prepared by Michael C. Sovereign of the University of Illinois for the General Learning Corporation under a U.S. Office of Education grant. The study identifies cost components for a variety of educational tasks and affords a useful base for comparisons of alternate systems. However, when taken too literally, such studies can be misinterpreted so as to miss main points of technological innovation —which may involve improvements in quality as well as extension of educational opportunities, but the costs of which frequently can be evaluated only in terms of "have" or "have not" situations.

In the situation described, it really is not possible or practical to set forth basic costing principles covering such service since charges
Planning for Media Within University Library Buildings

currently applied in schools and colleges (e.g., $1,000 to $4,000 per
position for remote access video systems installed in a library) can-
not be derived by simply summing figures, since once again the pro-
gram of services was not conceived originally as a unified whole.

In addition to basic program conception, many technical factors
must also be considered. And too much planning in the past has pro-
ceeded “by guess and by God” because it has been essentially “addi-
tive” rather than being conceived from the start as a total communi-
cation service planning task.

A first requirement to be noted immediately when “total” planning
is undertaken is the need to provide more than normal power if tele-
vision or computer equipment will be involved. The need for con-
trollable incandescent lighting plus other requirements can easily
lead to demands for an available current of 300 or more amperes.
Additional air-conditioning tonnage required by new electronic
resources and by heat generated from lights and equipment which
must be carried off by some means suggests giving special attention
to ventilation. Because audio recording may require “low pressure”
air distribution systems and special ductwork to avoid noise factors,
unusual ceiling heights may be specified.

Flexible use of a power grid system requires attention early in any
design effort. Because walls and ceilings used in studio recording
spaces must be capable of maintaining at least a forty decible noise
reduction ratio, special attention is required at an early stage of
planning. Simple loft plans can prove difficult to work with when
one is considering space for development and use of graphic ma-
terials. And these, in general, must have special light control and
ventilation as well as a reliable water supply free of normal sedi-
mentation and capable of very accurate temperature and rates of
flow control. Since these matters are highly technical they require
consideration and knowledge on the part of library consultants as
well as architects and engineers if a sound “total” plan is to be
realized.

Often superimposed on traditional functional or subject division
plans of library construction are individual study spaces, rooms for
typing and group seminars, language laboratory facilities, photocopy
rooms, temporary classrooms, reading laboratories, media distribu-
tion and equipment centers, television viewing and listening areas,
electronic learning service stations (i.e., “wet carrels”) and/or other
special rooms. These are often added without proper attention being

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paid to such technical matters as ventilation. Aphorisms such as "less glass for readers and more for staff" which take into account distraction factors and/or needed relief from monotony—tend to be "pseudo" laws rather than valid guides for development of a total concept of a communication and information center.

Thus, respecting such centers, library planners, consultants and architects may have to consider possibilities for providing a much broader range of services and facilities than any previously noted. And indeed, such rather new and unusual facilities as child care units (cf. that developed for Federal City College in Washington, D.C.) may also have to be considered to meet the problems of part-time working mothers. And this point raises a host of others which concern the places in which individual learning and methods may best be accomplished by a commuting student population as well as the growing body of adults living in a given community who may be expected to use campus libraries—ranging from high school students and pre-college groups for purposes of orientation to post-retirement, vocational learning, and enrichment programs sponsored for senior citizens.

In short, in addition to lively educational imaginations, a variety of new and very technical knowledge is required of library planners, for example, knowledge of special effects of dryness upon ultramicroforms which have high reduction ratios and which are subject to damage by unfiltered air. A planner should know the special benefits which can accrue from the use of rear image rather than front image projection equipment for microforms. (The latter tends to be more sensitive to the image-destroying effects of higher levels of ambient light.)

Among a brief listing of references, of particular interest is unique work reported by Rensselaer, an institution which has featured problems of communications service in relation to design of university facilities. A second volume on *New Media in Higher Education*, edited by James W. Brown, represents an essential item for any reading list. The Licklider book is obviously a "must" as are the reports of T. N. Dupuy on *Ferment in College Libraries* and *Computers on Campus* by John Caffrey and Charles J. Mosmann.

The single most comprehensive volume dealing with curriculum-related problems was issued some years ago at Stephens College. This volume indicates clearly and almost uniquely the depth to which a local study should go if it is to be truly comprehensive in identify-
Planning for Media Within University Library Buildings

In concluding this statement on planning uses of media within the library it would seem important to offer a few cautioning words and then to suggest something positive in the way of suggestions for procedure. First, as a caution, the field suffers from a serious lack of common standards and definitions, not to mention a paucity of reliable statistical information on the basis of which sound cost effectiveness studies can be conducted. Despite ALA efforts and work being done by various bureaus of library research sponsored by universities and other non-profit organizations (such as the Systems Development Corporation in Santa Monica), planning in the area remains difficult. Obviously every effort should be made to ascertain costs responsibly and to relate these to local planning problems. But continuing study must be encouraged to derive as soon as possible the kinds of standards, definitions, and usage of terms which can be accepted generally.

A second caution has to do with the lack of sufficient experimentation on the basis of which one can truly study and project future needs, for instance, of the kinds of manpower needed to manage an optimum library program and plans for administrative organization which will operate effectively when the communications service is seen as a unified entity (as distinguished from random pieces of service which may or may not fit well together).

Finally to be offered as a positive aid, the following checklist of factors is recommended for consideration in planning future library development:

1) Educational goals of the institution and methods of instruction employed (including various levels of teaching and research to be served by undergraduate curricula laboratories, to meet graduate student or research staff needs, etc.)

2) A definition of the library function (what is to be included and what need not be considered)

3) The number and kinds of special facilities and equipment which must be provided (identified in terms of subjects, media forms and formats, clientele, and/or intended use)

4) Amounts and kinds of integrated versus decentralized media use facilities (e.g., multi-media carrels versus group listening or viewing rooms)

5) Degrees of administrative centralization versus decentralization
to be afforded by the library system (through branches; in resource centers; by using satellite library arrangements)

6) Production and reproduction responsibilities (by whom? in what amounts? at what costs? to serve what purposes?)

7) The degree and nature of automated services (intended to help management, to provide information storage and retrieval services, to assist instruction and research. Who is to use the automation—individuals, classes, groups, et al?)

8) Such considerations as integrated versus separate cataloging of various forms of material; staffing patterns and budget arrangements; planned growth rates; special communications facilities; possibilities for cooperation with other agencies and institutions

9) Particular spaces, furnishings and equipment (needed for materials and equipment storage; maintenance and repair; office activity; individual and group study and use of library resources; previewing; conference work; displays)

10) Lighting and ventilation (incandescent, fluorescent, ultraviolet; window drapes and blinds; plans for use of microtext; dimming controls; air-conditioning requirements; special humidity and temperature regulators; need for dark rooms)

11) Communication control systems (centralized and/or remote; one-way or multi-way; dial access audio and/or video; computer access and display mechanisms; individual browsing facilities for use of audio-visual media; loudspeakers versus use of headphones; special communication equipment needs)

12) Reproduction services (graphic, photographic, electronic reproduction)

To sum up, the day has arrived when it is no longer useful to talk much about planning or construction of university library buildings as if these were independent units. The future really does not encourage such efforts. Insofar as the words “library” and, indeed, “librarian” still have meaning, they represent a heritage from the past which recalls performance of functions without which civilizations could not have developed nor endured—that is the preservation and distribution of recorded knowledge. But today these are tasks which call for a broadening diversity of arts, skills, and intellectual talents not demanded previously and for maintenance of new and changing facilities which will permit rapid production, distribution and use of a very wide range of modern communications technology.

Once the terms “library” and “librarianship” are acknowledged to
Planning for Media Within University Library Buildings

represent functional concepts rather than specific realities, it becomes easier for those made responsible to proceed with designing of facilities to provide optimum communication and information services. But let it be recognized at the outset that such facilities may not in the future look much like the traditional libraries of which universities have been so proud. Indeed, to recall an architectural adage, if form should properly follow function, then Cornberg's advice to campus planners quoted at the beginning of this article is worth recalling: "Plan no more buildings for library use. Library space is an anachronistic concession to the past which we can no longer afford."

The author is indebted to David Crossman, assistant director of the University of Pittsburgh Libraries for Instructional and Research Services and nationally-known consultant on dial-access systems. Dr. Crossman provided an extensive review of current technical problems encountered in planning new media services for the college or university.

References