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ABSTRACT

By studying literature and conducting an extensive survey of a community, students, population, size of faculty, and curricula, a proposed media facilities model was drafted for a large suburban high school. Recommendations for equipment to be installed in each classroom are given, along with equipment and materials to be shared by departments or housed in central administration. Specific recommendations are made by subject areas including facilities for a language laboratory, science, business, arts and crafts, homemaking, industrial arts, and English, social studies and geography. A learning resource center and television studio are proposed, along with a production area for graphics use. It is further proposed that schoolwide instructional areas, including gymnasia, swimming pool, auditorium, cafeteria, and health-services area be equipped for audiovisual use. (SK)

Indiana University of Pennsylvania
The Graduate School
Learning Resources and Mass Media Department

A MEDIA FACILITIES MODEL FOR A PROPOSED LARGE SUBURBAN HIGH SCHOOL

A Thesis

by

James R. Rainey

Submitted in Partial Fulfillment

of the Requirements for the Degree

Master of Education

May 1975

April 25, 1975 — Daniel C. Matter Jr.
Chairman, Learning Resources and Mass Media Department

April 25, 1975 — Edward R. Hurst
Associate Dean for Research

CHAPTER I

THE PROBLEM

Contemporary America is experiencing a school construction boom which is a product of two other booms, these were: (1) the two year baby booms of the early post world war and the Korean war years and (2) the emergence of instructional technology in the late 1950's. The American education system has not always been able to provide adequately for all types of learning for the school child. Learning might be significantly improved if the revolution of information processing and communication could be harnessed to the tasks of instruction. A society hurtling into the age of the computer and the satellite can no longer be held back by an educational system which is limping along at the blackboard and text-book stage of communications. New schools' plans must take into account this new technology and the vast numbers of new students to facilitate learning by them. Planning must provide for the inclusion of appropriate instructional technology. Lacking a comprehensive plan for such a design and faced with reality of actually having to design such a school plant, the researcher has sought here to develop a model which might be used as a guide.

A good media model will serve new functions well into the next century and even new goals during its lifetime. It is in the designing stage where ideal, media models can suggest facilities that will adequately meet demands and requirements of present and future educational

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programs. Media models need to be constructed as a guide for educators to follow. Form follows function, and the best media facilities model means greater learning and better teaching.

Statement of the Problem

The purpose of this study is to develop a model in which media facilities can be designed as an integral part of a proposed large suburban high school. Such a model focuses on the concept of facilitating learning, and it belongs to that same general class of educational problems.

Theoretical Hypothesis

A media facilities model can be designed for a proposed large suburban high school.

Need for the Study

American education is changing in many ways. Some of this change is quite fundamental. The design of school buildings, furnishings, and equipment can facilitate, or retard these changes. New materials, equipment and systems are at hand, already providing the means for greater independence in learning. All aspects of instructional technology and every problem which may arise in its use must be considered. "It is ironic that many existing facility errors could have been avoided if the new skills waiting in the wings had been consulted".[1]

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[1]Robert Propst, High School: The Process and the Place, (New York, N. Y., Educational Facilities Laboratories Inc., 1972), p. 106.

Certain types of facilities are emerging and have potential merit for present and future facilities design. Decisions should be made from a careful and comprehensive study of the many factors which are involved. The behavioral sciences, and life itself, provide ample evidence that learning and growth are deeply affected by the environment in which they take place. Sound planning can create an environment which facilitates learning. Design will develop a method of planning that will hopefully eliminate the base of the confusion and poor practices that now exist throughout the nation. Good design will create facilities that will not become obsolete before they become operational. It is hoped the principles explored in this research will be applied by educators in their communities to create high schools that are more responsive to the contemporary needs of the young, more sensitive, humane and supportive of learning and teaching.

Limitations of the Study

The application of the model developed in this study is limited to high schools of suburban areas with 20,000 to 30,000 population. The building capacity is for some 1,500 students, seventy-five teachers, six specialists and three administrators. The suburban area might be twenty to thirty square miles in size so that 95% of the students are bused to and from school.

The model, however, may generally include a number of other types of schools which appear to be somewhat similar to the parameters outlined above. Suitable modifications of this model should be easy to accomplish.

Definition of Terms

Media refers to all forms of carriers of information, print and non print through which the learner actively or passively interacts with the learning environment.

Resources - This expression refers to the entire spectrum of educational media. In this sense all of the media from print to computer may be linked in a system, or used individually in optimum combination to achieve educational objectives.

Facilities are physical components such as buildings, rooms, equipment and materials used to accomplish the instructional task.

A model is a preliminary presentation made to be followed or imitated because of its comprehensive consideration of relevant factors.

In this study the term instructional technology is defined as the devices and the materials which are used in the process of learning and education born of the communications revolution.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

A comprehensive review of literature concerning media facilities was completed. The general sources consulted were:

1. Handbook of Research on Teaching, edited by N. L. Gage, 7th ed., Chicago, Rand McNally & Company, 1971.

2. Encyclopedia of Educational Research, edited by Robert L. Ebel, 4th ed., N. Y., Macmillan, 1969.

3. Masters Thesis in Education, 1951-1973, Cedar Falls, Iowa.

4. Articles from these periodicals; Journal of Educational Technology, High School Journal, Audiovisual Instruction, American School Board Journal, American School and University, Library Journal, AV Communicative Review and School Management were procured from the Education Index.

The major sources consulted were: Research in Education (ERIC), Current Index to Journals in Education (CIJE), a computer search by the Probe Office, Indiana University, Bloomington, Indiana. A second computer search was (RISE), Research and Information Services for Education from King of Prussia, Pennsylvania. A third search (ERSI), Educational Research Service, Inc., of Arlington, Virginia. In addition, Educational Facilities Laboratories Incorporated of New York, and the Council of Educational Facility Planners of Columbus, Ohio; publications were searched.

Extensive amount of time was spent locating and examining published materials that had a bearing on the problem. Reports and studies that might offer guidance and lend direction in planning media facilities were investigated. This comprehensiveness was thought to be

necessary in as much as a model for school plant media is sought as a result of this study.

The following sources provided important ideas for the study to wit: A Guide for Evaluating, Establishing and Developing School Media Programs[1] points out the strengths and weaknesses of the physical components of the media program evaluated. In view of the diverse variety of physical facilities it is difficult to advocate precise standards.

Educational Facilities with New Media[2] were investigations that revealed learning media having a large impact on education. The growth of instructional media in the last twenty years indicates its expanded role in the educational process. The planning of school buildings in which media are to be used requires great care in the detailed design and equipping of facilities. Spaces equipped for media requires more critical design and planning. It is recognized that in planning spaces with media much authoritative opinion is needed.

Recommended Guidelines for Facilities, Equipment, Grounds, and Maintenance[3] set minimum physical facility standards and listed a set of guidelines drawn up in outline form for the Iowa Public Schools. This

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[1]Cecil E. Stanley, A Guide for Evaluating, Establishing, and Developing School Media Programs (Nebraska: Department of Education, 1973), p. 14.

[2]Alan C. Green, Educational Facilities with New Models (Washington, D. C., National Educational Association, 1972), p. 209.

[3]Recommended Guide Lines for Facilities Equipment, Grounds and Maintenance, (Des Moines, Iowa: Department of Public Instruction, 1966), p. 15.

guideline gives recommended figures and equipment, personnel and facilities to support an Instructional Media Program in ratio to the number of students and teachers.

Worksheets for Planning Media Facilities[4] presents a checklist to use in planning a new building or remodeling an older one. By selecting the area function one can determine the facilities to consider. This type of preplanning insures consideration of many media items easily overlooked.

Evaluative Checklist, an Instrument for Self Evaluating an Educational Media Program[5] stresses that when properly applied to a school system, this checklist will discriminate among the several levels of quality in educational media programs.

Standards for School Media Programs[6] sets standards that describe the services of the media programs in the school and rates the requirements for the staff, resources, and facilities needed to implement the program effectively.

Guidelines for Instructional Media Services Program[7] was written to assist school administrators who wish to up grade their instructional

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[4]Edward A. George, Worksheets for Planning Media Facilities (Pennsylvania: Department of Education, 1973), p. 33.

[5]Kenneth L. King, Evaluative Checklist, an Instrument for Self-Evaluating and Educational Media Program (Washington, D. C.: Association for Educational Communications and Technology, 1973), p. 12.

[6]Standards for School Media Programs, (Chicago, Illinois: American Library Association, 1969), p. 66.

[7]Guidelines for School Media Programs, (West Chester, Pennsylvania: Service Project and Area Research Center, 1970), p. 90.

media service programs at the school district level. These guidelines give recommended figures for equipment, personnel and facilities to support an instructional media program in ratio to the number of students and teachers. They are organized to offer guidance in programming and planning of appropriate educational facilities.

Recommended Quantitative Guidelines for Instructional Media[8] indicates the minimum standards for audiovisual equipment and personnel.

Reading and studying the above eight sources provided important and essential background information required for direction and standards to follow in designing an instructional media facility for a large suburban school.

Planning for Learning

The measure of effectiveness for any school system is the impact that system has on student learning. Planners must recognize the impact of media and develop facility types that will support and extend their contribution of effective learning. It is in the planning stages where ideal models can become reality. Gross and Murphy[9] cite the Trump Commission view that: "Building design makes a major contribution to a school program aimed at quality education by providing greater flexibility." They take the view that, "The school building planned today

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[8]Recommended Quantitative Guidelines for Instructional Media. (Harrisburg, Pennsylvania: Department of Public Instruction, 1968), p. 17.

[9]Ronald Gross and Judith Murphy, Educational Changes and Architectural Consequences (New York: Educational Facilities Laboratories, Inc., 1971), p. 16.

will serve new functions well into the next century and even new goals during its lifetime."

Educators and architects, working cooperatively, can create an ever changing constantly improvable environment for the learning process. Vallery[10] says, all too often "the weakest link has been the role played by educators." Designing for educational functions and users requirements should take precedence over architect's aesthetic sensibilities. Educators must plan for the uses of media in the classroom, and educators and architects together through the programming process must specify appropriate facilities for effective use of media.

The model being developed here requires special consideration beyond routine school architecture to assure the creation of an appropriate learning environment. Volpe[11] says,

> It is obvious that the architect and facility planner must do more than just look at what has already been built. They must envision and create facilities that will adequately meet the demands and requirements of present and future educational programs.

Special Considerations in Planning for Learning: Brown[12] feels, "educational objectives can be accomplished by designing facilities to increase the effective use of media in the learning area." Rarely do

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[10]Hugh J. Vallery, "Planning Tomorrow's Schools," Journal of Educational Technology, I (June, 1970), p. 9.

[11]Gerald Volpe, "Planning Higher Education Facilities," Educational Technology, I (June, 1970), p. 19.

[12]J. W. Brown and Lewis Harcleroad, A. V. Instruction, Media and Methods (New York: McGraw-Hill Book Company, 1969), p. 34.

we find a school that has combined all the knowledge accumulated to date in designing media facilities. Evidence of good design in planning can save years in making instruction productive and responsive.

Erickson[13] says,

> It is a fact that the physical environment for education has already undergone and is undergoing desirable change, and media is having a new and potent influence on these changes.

DeBernardis[14] states, "Planning should be based on soundly conceived educational uses of the media to be employed." All available sources of information in planning must be used to insure that nothing has been overlooked. Planning should result in specific instructions for the architect regarding the educational media to be employed.

DeBernardis[15] further says,

> It is often stated without good teachers there cannot be good teaching. However, even good teachers need materials and equipment if they are to function at their best.

Our advanced technology has produced an abundance of materials and equipment to promote learning. Appropriate media should be available in every learning area where the instructional tasks are being performed. The role played by media depicts the kind of facilities to be installed so teachers can make use of media naturally

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[13]Carlton W. H. Erickson, Administering Instructional Media Programs (New York: The Macmillan Company, 1970), p. 175.

[14]Amo DeBernardis and others, Planning Schools for New Media, (Oregon: Portland State College, 1961), p. 7.

[15]Ibid., p. 11.

and conveniently. The P. L. R. A. Guidelines[16] state, "in locating and placing facilities for media, it is helpful to consider all the total staff functions which relate to the media program." A School Management[17] editorial says, "There is a greater number of special facilities being included in new school construction."

Problems in School Plant Planning

For effective use of projected media, coordinated projection systems pose new and unique problems for architects and planners. The type and size of screens have a considerable effect on how many people can view it under optimum conditions. Westley and Severin[18] report, "that there is a positive correlation between distance from the screen and achievement." Television receivers need to be placed in the most advantageous positions. Chapman[19] recommends that "a line of vision not more than 45° from the axis is the maximum angle recommended for viewing most material without objectional distortion. The maximum viewing angle of the closest seated viewer should not exceed thirty degrees." These authors raise important considerations with regard to

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[16]Pennsylvania Learning Resources Association, Guidelines for Instructional Media Services Programs, Rev. Ed. (West Chester, Pa.: Services Project and Area Research Center, 1970), p. 56.

[17]"Report on Facilities in New Schools and Additions," School Management, (July, 1971), p. 19.

[18]Bruce H. Westley and Werner J. Severin, "Viewer Location and Student Achievement," Audiovisual Communication Review, XIII (Fall, 1965), pp. 270-274.

[19]Dave Chapman, Design for ETV --- Planning for Schools with Television, (New York: Educational Facilities Laboratories, Inc., 1960), p. 33.

the location of the viewing screens and learner achievement.

Classrooms should be equipped with bulletin boards, chalkboards, projection screens, map rails and storage facilities needed for particular type of instruction conducted. Hickman[20] says, "instructional areas can take many forms and shapes; a teaching "well" divided by alternating chalkboard and tack board panel and a middle panel is used as a screen for projection."

Another problem area is that of lighting, now Kelly[21] says, "Areas should be planned so lighting may be controlled and lower light levels are possible." Each classroom should be equipped with full light control, electrical outlets, and forced ventilation. The level of light satisfactory for projecting media varies according to the type of equipment and materials, and the size of the image. A variety of light levels will be needed, regardless of the medium being used. Enough light must be available to allow note taking, to read printed material and for eye to eye contact. All primary task surfaces should appear about equally bright, and surrounding environment should be no less than 1/10 as bright. Proper controls must be provided to permit quick, convenient adjustment of artificial and natural light.

The many electronic teaching devices used in schools and the future appearance of other devices means special consideration of

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[20]L. C. Hickman, ed., "The New Environment: How 16 Award Winning Schools Compare," Nation's Schools, (January, 1972), pp. 45-64.

[21]Gaylen B. Kelly, "Technological Advances Affecting School Instructional Centers," Audiovisual Instruction, XIV (September, 1969), pp. 42-48.

wiring in planning new school buildings. Iowa State Department of Public Instruction[22] says, "Each classroom shall have at least one electrical outlet on each wall. Switches should be provided at the entrance to all spaces in the building."

Increased use of audio materials and devices require means of controlling sound and reducing reverberation. Talbot[23] states, "A problem that prevailed was the carryover of teacher voices from one area to the next or the relative inaudibility of some voices." Classrooms should have an acoustical tile ceiling. In large open instruction areas, carpeting of the proper quality for absorption is a necessity. Justus[24] says, "Studies have shown that energy and physiological capital of pupils are unnecessarily consumed by uncontrolled sound." Sound isolation between teaching spaces require airtight construction.

Air conditioning, heating, ventilating, cooling, and humidity control are virtual standard equipment for school buildings. Educational Facilities Laboratories[25] state, "Already 8% of the nation's schools are air conditioned, and 30% of all new schools built each year

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[22] Recommended Guidelines for Facilities, Equipment, Grounds and Maintenance, (Des Moines, Iowa: Department of Public Instruction), July, 1969, p. 3.

[23] J. E. Talbot, "Open Plan: They Tried It, They Liked It," American School and University, (March, 1972), p. 20.

[24] Justus, John E. ed., Athens Junior High School, Athens, Tennessee: Profile of a Significant School (Knoxville, Tennessee: University of School Planning Laboratory, July, 1970).

[25] Places and Things for Experimental Schools, (New York: Educational Facilities Laboratories, Inc.), February, 1972, p. 106.

are equipped with air conditioning." Temperature variations should be minimal throughout the day. A fairly uniform temperature contributes a great deal to bodily comfort and mental efficiency. The primary aim in designing and constructing schools has been to provide pleasant, healthful, and convenient physical environments. The design, construction, manipulation and improvement of the physical learning environment clearly require the expert contributions of educational media personnel who are familiar with the educational purpose for which facilities will be used and standards to which they should adhere.

The interaction of the media director with the teachers, the school administrators, and various architectural, acoustical electronic engineers is fundamental in the planning and design of new facilities.

Media models such as the one developed in this study need to be constructed as a guide for educators engaged in school planning and program development.

Green[26] emphasizes, in his design criteria,

> That for effective and efficient utilization of media new concepts of facilities and their design must be developed. In his Report B, general planning principles and design guidance for a variety of facilities are developed for the use of media.

The optimum utilization of learning media requires conscientious planning efforts and the development of new design concepts in educational facilities.

The design and planning of a new school plant is a comprehensive

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[26]Alan C. Green, Educational Facilities with New Models, (Washington, D. C., N. E. A., 1972), p. 209.

task as noted elsewhere in this chapter. Many special considerations must be taken into account when such a plant focuses on the concept of facilitating learning by means of media usage. These new plants will be easier to design if the developers have some model to use as a guide. Fundamental to such a model is the involvement during planning of the teachers, students and administrators who will be using the building. It is precisely one such model which is to be the end product of this study.

CHAPTER III

PROCEDURE

In this study a number of variables and factors were examined and a suggested model for designing school buildings with incorporated media facilities will be created. Integral to the study is canvassing the ideas of teachers and administrators who may use such a school plant.

Independent Variables

The independent variable is adequate facilities for facilitating learning by the students of a large suburban high school through the use of media. This variable may be deduced from all of the elements which eventually compose the model.

Dependent Variables

The dependent variables are: size of student population, the number of faculty and staff, curricula offered, the scope of the media program, finances available, trends in educational technology related to learning, and innovation in school plant design.

Measurement Instruments

Variables such as: student population, size of faculty, financial limitations, and data regarding curricula will be provided by the Director of Secondary Education. Trends and innovations will be

reported in the form of authoritative statements such as those contained in chapter two. In order to determine the physical and environmental facilities and the scope of the media program, a measurement instrument in the form of a survey was designed by the researcher and validated by four independent authorities, two at the collegiate level and two at the public school level. This instrument together with statements with regard to its content validity are contained in Appendix A and B.

The Research Design

In this design data with regard to the variables under investigation were determined by:

a. The appeal to authority in the form of statements of expert opinion.

b. Obtaining data with regard to appropriate variables from the administration in the school district where the study is being conducted.

c. Obtaining data about facilities and media from all secondary teachers in this school district, since they are potential users of the building ultimately to be built from plans which incorporate the model in this study.

Such a research design is regarded as valid since a particular type of school district requiring a particular type of school building plan represent the precise situation for which this model is being designed. As noted in chapter one, limitations of the study, generalizations of the findings and use of the model developed here is limited to such schools as the one studied here, and the parameters outlined in the statement of the problem. Each academic department were surveyed for its views. All faculty members in each department will respond to the survey.

Hypothesis

A media facilities model for a large suburban high school can be designed by obtaining the recommendations of the authorities in school plant design, by using the school district's administrative and fiscal data, by surveying the needs of teachers and administrators who will ultimately use this facility, and by appeal to authority.

Decision Rules

1. Include items for departmental use only on those requested by one-third or fewer teachers either for departmental, corridor or to a restricted number of classrooms. Where an item is portable, they will be placed in a central storage area where those teachers who need them can obtain them.

2. Where a majority of the teachers of a department want an item or items and the items are non portable, they will be placed in every room so that a teacher assigned to that room may or may not use them as the teacher chooses.

3. When it comes to linear feet of materials such as chalkboard, display board, shelves, etc. the average of the footage requested will be installed in each room of that department, but a minimum of one chalkboard and one display board will be in each room.

   a. In order to provide for those teachers who want more than the average footage a suitable number of portable boards will be available from the media coordinator.

4. When it comes to items such as projectors and recorders, each department will be assigned that number of each item of equipment, which represents the average request for teachers in that department.

Standards for School Media Programs and Guidelines for Instructional Media Services Programs recommended minimum standards for materials and equipment will be used to insure optimum equipage. On matters such as heat, light, storage, and seating; a combination of the amount requested plus the amount recommended by the school architect and following "The School Plant Guide for Planning School Plants in Pennsylvania" will be used.

The above decision rules were designed by the researcher on the basis of recommendations and suggestions provided by eminent authorities. It must be remembered that this model relies heavily upon the results of the teacher survey, therefore, the findings of this survey reported in chapter four may suggest revised decision rules which will be discussed in chapter five and incorporated in the final model reported in chapter five.

The research design, unlike purely statistical models, does not provide in and of itself research control. Control is obtained in this study by surveying the total population of teachers involved, plus using preplanned decision rules to be applied to data provided by those teachers. Additionally the revision of the decision rules will be made on the basis of the findings generated by the teacher data, also decisions involving such factors as heat, light, and equipment standards will be based upon recommendations of authority. In this manner objectivity is preserved by eliminating researcher bias through the medium of eliminating decisions based on his point of view, i. e. the model will be based solely on the ideas and data provided by experts and teacher survey.

Chronological Steps in Study

1. Identified the problem.
2. Surveyed the literature.
3. Designed the research.
4. Developed the instrument.
5. Administered the instrument.
6. Analysed the data using previously planned decision rules.
7. Reported the findings.
8. Made necessary revisions.
9. Designed the model.
10. Wrote the report.

CHAPTER IV

FINDINGS

The research as designed in chapter three was conducted. Chronological steps in the study were followed implicitly.

Hypothesis

A media facilities model for a large suburban high school can be designed by obtaining the recommendations of authorities in school plant design, by using the school district's administrative and fiscal data, by surveying the needs of teachers and administrators who will ultimately use this facility. and by appealing to authority.

Findings---School Design Personnel

In American School and University (March 1970) the view is repeatedly emphasized from the inception of the design the school architects recommended input from the potential user of the facility. The architects will build the educators the facility they desire if the architects know their needs. Erdman[1] who wants every fact he can get states, "The more input the client can give us is an advantage". The Journal of Educational Technology (June 1970) emphasizes instructional technology and demands new concepts of facilities and their design for

[1]Michael P. Erdman, "How to Help and Hinder Your Architect", American School and University, (March 1971), p. 20.

effective and efficient utilization of media. Green (1969), DeBernardis (1961), and Erickson (1970) recommend, for effective use of media in education, the manner in which classrooms, seminar rooms, independent study facilities and other learning spaces are furnished is an important design decision.

Finally, it is the media director's responsibility to relate building design to the use of educational media. There is something special about learning and it should be reflected in media facilities design.

Findings---Plum Borough School District Administrative and Fiscal Data

A program of providing modern educational facilities for the continually increasing number of children is progressing on schedule in Plum Borough. Preliminary plans for a proposed new high school to house fifteen hundred students has been approved and are awaiting a final decision to proceed.

Members of the Board of School Directors are entrusted with the responsibility of providing a desirable program of education for the community. The improvement of the schools to meet the educational needs of the children must be a continuing process. The curriculums must continuously be revised and enriched, adapted to modern life, and made broad and flexible to meet the needs of all the citizens. They must meet the vital needs of the educational program that will enable the children to solve their problems in a complex, changing society.

The space, financing and money allocations for the proposed high school are as follows:

Proposed Secondary School Space Allocations

Department of Education
Bureau of School Construction
Harrisburg, Pa. 17126

Form Number DEBE-498 (4/71)

Type	Size in Sq. Ft.	No. Rooms	Total Sq. Ft.
Regular Classroom English, Social Studies, Special Education, Geography and Mathematics	850	32	27,200
Double Classrooms	1700	1	1700
Language Laboratory	850	1	850
Instructional Planning Center	425	2	850
Science Classroom Laboratory	850	1	850
Biology	1125	3	3375
Chemistry	1125	1	1125
Student Project Room	220	3	660
Physics	1125	3	3375
Business Classroom	850	1	850
Typing	1125	2	2250
Art-Craft	1000	3	3000
Learning Resource Center	4500	1	4500
Television Studio	2500	1	2500
Gymnasium-total floor area	7500	1	7500
Swimming Pool	7500	1	7500
Auxiliary Gymnasium	2500	1	2500
Remedial Gymnasium	1000	1	1000
Girls' Locker Room and shower room	2400	1	2400
Boys' Locker Room and shower room	2400	1	2400
Auditorium	13000 seating capacity for 1000	1	13000

Type	Size in Sq. Ft.	No. Rooms	Total Sq. Ft.
Homemaking Suite	1000 three teacher stations	3	3000
Industrial Arts	2400	3	7200
Planning and Storage Areas	1000	1	1000
Music	1500 two teacher stations	1	1500
Health Suite	850	1	850
Faculty Rooms	425	3	1275
Cafeteria-Dining Area	7500	1	7500
Faculty Dining	540	1	540
Kitchen and Storage	4200 seating capacity 750, to serve 1500	1	4200
Administrative Suite			
Principal	150	1	150
Conference	150	1	150
Files & Circulation	100	1	100
Office Waiting Area	220	1	220
Guidance Waiting	100	1	100
Storage, Vault, Toilet, Public Address System	230	1	230
Staff Members (6)	720	1	720
Clerks (3)	360	1	360
Conference Room	420	2	840
Student Activity	425	2	850
Seminar Room	425	2	850

Five per cent deviation from scheduled areas permitted to facilitate architectual design. This is not to be interpreted as an across the board reduction or increase of space allocation.

	Total	122,120
Total Square footage (inc. pool-fieldhouse).....		122,120

General Contract	$4,467,000.00
Plumbing Contract	783,200.00
Heating Contract	712,000.00
Electric Contract	800,000.00
Total Contracts	$6,762,200.00
Architects Fee	405,732.00
	$7,167,932.00
Furniture and Equipment	750,000.00
GRAND TOTAL	$7,917,932.00

The proposed high school building site and grounds would encompass fifty-six acres. The proposed high school site would use thirty-eight of these acres.

A more detailed break-down of the above costs would include:

$ 40.22	cost per square feet
$4,240.75	cost per pupil
73.71	square feet per student

The financing of the new high school will be accomplished by a bond issue at six percent interest extended over a thirty year period.

Findings---Appeal to Authority

W. R. Fulton[2] reported in his criteria for physical facilities for educational media that:

a. Each classroom should be designed for and provided with essential facilities for effective use of appropriate educational media of all kinds.

b. Each classroom should be equipped with full light control, electric outlets, forced ventilation, and educational media storage space.

c. Classrooms should be equipped with permanently installed bulletin boards, chalkboards, projection screens, map rails, and storage facilities needed for the particular type of instruction conducted in each classroom.

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[2]W. R. Fulton, Evaluative Checklist: An Instrument for Self-Evaluating and Educational Media Program in School Systems, (Washington, D.C.: Association for Educational Communication and Technology, 1969).

Department of Public Instruction[3] describes recommended guidelines and suggested minimum amounts of media hardware. The quantity of equipment should be based on local interest, number of professional staff members and design of educational facilities. The local curriculum may necessitate modifications in the suggested guidelines for instructional needs. With the rapidly expanding educational technology field today, every effort should be made by all educators to be aware of new improvements or additions to the media field.

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[3]Recommended Quantitative Guidelines for Instructional Media, (Harrisburg, Pennsylvania: Department of Public Instruction, 1968).

RECOMMENDED QUANTITATIVE GUIDELINES
FOR
INSTRUCTIONAL MEDIA
WINTER, 1967-1968

AUDIOVISUAL EQUIPMENT GUIDELINES FOR SECONDARY EDUCATION

ITEMS	ADEQUATE	SUPERIOR
16mm Projector	1 per 10 teaching stations	1 per 4 teaching stations
2x2 Slide Projector (Automatic)	1 per 10 teaching stations (remotely controlled)	1 per 2 teaching stations (remotely controlled)
Filmstrip Projector (or combination Filmstrip-Slide Projector)	1 per instructional building	1 per 2 teaching stations
Filmstrip Viewer	1 per 10 teaching stations	1 per teaching station
	Also a quantity of viewers (1 per 2 teaching stations) should be available from a central source within the building for special project use or for individual study (school or home).	
Sound Filmstrip Projector	1 per school district	1 per building
3¼x4 Projector (lantern slides) (Auditorium)	1 per school building with local slide production facilities	no further recommendation
Overhead Projector Classroom Type (10x10 inch with removable acetate roll)	1 per 4 teaching stations with small size projection cart	1 per 2 teaching stations
Overhead Projector (10x10 inch) Auditorium type	1 per large group instruction room	no further recommendation at this time
	The expression "an auditorium model overhead" merely implies that the machine utilized have sufficient light output and optical capabilities to project a satisfactory image in an auditorium type situation.	

ITEMS	ADEQUATE	SUPERIOR
Opaque Projector	1 per building	no further recommendation at this time
Micro-Projector	1 per school	1 per 6 teaching stations
Record Players	1 per 10 teaching stations	1 per 3 teaching stations
Tape Recorders	1 per 10 teaching stations	1 per 3 teaching stations with additional units for each modern foreign language classroom
Listening Units	1 per floor, 1 unit should have 12 headphones	additional units dependent upon instructional program
Projection Carts with electrical cords	1 per 5 teaching stations or 1 per portable piece of equipment purchased at the time equipment is purchased	needed quantity permanently assigned to each teaching station
Light Control	Every classroom should have adequate light control. Adequate implies the availability of facilities to control light to the extent that all types of projected media can be utilized effectively.	
Radio Receivers (AM-FM)	3 per building	1 per 4 teaching stations
Projection Screens	One correctly positioned and permanently mounted, 70x70 with keystone elimination. Larger screens should be used in auditorium or large group instruction areas. Size of classroom determines feasibility of 70x70 inch screen.	no further recommendations at this time
Rear Projection Screens	1 per building or as needed for individualized instruction or to solve light control problems	additional units as needed

ITEMS	ADEQUATE	SUPERIOR
Local Production Equipment per school 16mm Cameras Dry Mount Press and Tacking Iron Paper Cutter Transparency Production Equipment Typewriter with Large Type Face Spirit Duplicator Rapid Processing Camera 35mm Still Camera Film Rewind Film Splicer (8 - 16mm) Audiotape Splicer Mechanical Lettering Devices 8mm Cameras	1 item per building or 2 items per district resource center	additional amounts and types should be provided to support local instructional materials program. Advanced program should include the following additional types: Transparency Production Equipment Mechanical Lettering Equipment 8mm Camera Photographic Accessories as needed Copy Camera and Stand
8mm Projector (single concept, continuous loop cartridge)	1 per 5 teaching stations (recommended format - super 8)	1 per 2 teaching stations
8mm Projector (Optical and/or Magnetic)	1 per 5 teaching stations (recommended format - super 8)	additional when justified
Videotape Recorder	1 per building	no further recommendation at this time
	It is the responsibility of the schools of the Commonwealth to become aware of and comply with the laws governing the recording and use of the copyrighted materials.	
Closed-Circuit TV	All new building construction should include provisions for installation at each teaching station. Older buildings should be wired for closed-circuit television.	no further recommendations

ITEMS	ADEQUATE	SUPERIOR
	It is the responsibility of the schools of the Commonwealth to become aware of and comply with the laws governing the recording and use of the copyrighted materials. The closed-circuit distribution system should provide the following broadcast sources: 1. Provisions should be made to originate signals from any teaching station to be distributed, if necessary, throughout the entire instructional unit. 2. Any or all broadcast and video taped signals should be available simultaneously to any teaching station. 3. All sources of radio broadcast such as AM, FM, and FM-Multi-Plex should be available for central distribution.	
Electronic Learning Laboratory	1 per building when appropriate to instruction	2 per building if required by student enrollment in language program
Electrical Outlets	two double outlets at front and rear of all classrooms and one accessible to all work tables or student laboratory desks. Each standard classroom shall have two separate AC electrical circuits.	no further recommendation
Multi-Media Portable AV Unit (audio and visual equipment in same unit)	1 per building	additional units when needed
Television Projector	1 per school building	additional units for large group instruction
TV Receivers	1 per teaching station	additional units as usage and programming requires

ITEMS	ADEQUATE	SUPERIOR
Microscopic Closed-Circuit Television System	1 per building	additional units for large group instruction
Television Monitors	2 per CCTV micro-microscopic unit and 2 per video tape recorder	additional units when justified
Commercial Television Cable Service	Should be available to each school building	
Computer (Demonstration Model)	1 per building when computer logic or computer circuitry is taught	additional units dependent upon instructional and student interest
	It is recommended that adequate storage space be provided and assigned to each item for central distribution. Special requirements on humidity compensation, light, dust and temperature control must be made regarding specific materials and equipment in an audiovisual center.	

Alan C. Green[4] announced changing educational methods, coupled with the uses of media, has changed the form of the classroom and the way it functions. Equipment and hardware are undergoing constant modifications and improvements may be expected to contain change. Many spaces designed and built today will eventually contain media hardware even though uses of media in the spaces are not a design factor for the present. Certain facilities are less conducive to change. Seating, storage cabinets, furniture, lighting, acoustical treatment, and climatic conditioning not subject to change should be well provided.

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[4]Alan C. Green, Educational Facilities with New Methods, (Washington, D. C., National Education Association, 1972).

Standards for School Media Programs[5] describes the services of the media program in the school and notes the requirements for the staff, resources, and facilities needed to implement the program effectively. Standards for personnel, resources, expenditures, and facilities are presented. Quality education needs facilities of adequate size and functional design.

	Basic	Advanced
16mm sound projector	1 per 4 teaching stations plus 2 per media center	1 per 2 teaching stations plus 5 per media center
8mm projector (only equipment for which materials exist at the appropriate school level should be procured)	1 per 3 teaching stations plus 15 per media center	1 per teaching station plus 25 per media center
2x2 slide projector remotely controlled	1 per 5 teaching stations plus 2 per media center	1 per 3 teaching stations plus 5 per media center
Filmstrip or combination filmstrip-slide projector	1 per 3 teaching stations plus 1 per media center	1 per teaching station plus 4 per media center
Sound filmstrip projector	1 per 10 teaching stations plus 1 per media center	1 per 5 teaching stations plus 2 per media center
10x10 overhead projector	1 per teaching station plus 2 per media center	1 per teaching station plus 4 per media center

[5]Standards for School Media Programs, (Chicago, Illinois: American Library Association, 1969).

	Basic	Advanced
Opaque projector	1 per 25 teaching stations or 1 per floor in multi-floor buildings	1 per 15 teaching stations plus 2 per media center
Filmstrip viewer	1 per teaching station plus the equivalent of 1 per 2 teaching stations in media center in elementary schools and 1 per 3 teaching stations in media center in secondary schools	3 per teaching station plus the equivalent of 1 per teaching station in media center in elementary schools 3 per teaching station plus the equivalent of 1 per teaching station in media center in secondary schools
2x2 Slide viewer	1 per 5 teaching stations plus 1 per media center	1 per teaching station plus 1 per media center
TV receiver (minimum 23 in. screen)	1 per teaching station and 1 per media center where programs are available	1 per 24 viewers if programs are available, in elementary schools 1 per 20 viewers in classroom, where programs are available, in secondary schools 1 per media center in both elementary and secondary schools
Microprojector	1 per 20 teaching stations	1 per 2 grade levels in elementary schools 1 per department where applicable in secondary schools 1 per media center
Record player	1 per teaching station, K-3 1 per grade level, 4-6	1 per teaching station, K-6, plus 5 per media center 1 per 5 teaching

	Basic	Advanced
	1 per 15 teaching stations in junior high and secondary schools	stations plus 5 per media center in junior high and secondary schools
	3 per media center	1 set of earphones for each player
	1 set of earphones for each player	
Audio tape recorder	1 per 2 teaching stations in elementary schools plus 2 per media center	1 per teaching station plus 10 per media center in elementary schools
	1 per 10 teaching stations in junior high and secondary schools plus 2 per media center	1 per 5 teaching stations plus 10 per media center in secondary schools
	1 set of earphones for each recorder	1 set of earphones for each recorder
Listening station	A portable listening station with 6-10 sets of earphones at the ratio of 1 per 3 teaching stations	1 set of 6-10 earphones and listening equipment for each teaching station and media center
Projection cart	1 per portable piece of equipment, purchased at the time equipment is obtained.	
Projection screen	1 permanently mounted screen per classroom plus additional screens of suitable size as needed for individual and small group use. The permanent screen should be no smaller than 70x70 with keystone eliminator.	
Closed-circuit television	All new construction should include provisions for installation at each teaching station and media center. Older buildings should be wired for closed-circuit television with initiation of such programs.	
Radio receiver (AM-FM)	1 per media center plus central distribution system (AM-FM)	3 per media center plus central distribution system (AM-FM)

	Basic	Advanced
Copying machine	1 per 30 teaching stations plus 1 per media center	1 per 20 teaching stations plus 1 per media center
Duplicating machine	1 per 30 teaching stations plus 1 per media center	1 per 20 teaching stations plus 1 per media center
Micro-reader (some with microfiche attachment)	Equivalent of 1 per 10 teaching stations to be located in the media center	Equivalent of 1 per 5 teaching stations to be located in the media center
Micro-reader printer	1 per media center	3 per media center
Portable video tape recorder system (including cameras)	1 per 15 teaching stations with a minimum of 2 recorders per building	1 per 5 teaching stations with a minimum of 2 recorders per building
Light control	Adequate light control in every classroom and media center to the extent that all types of projected media can be utilized effectively	
Local production equipment	Per building: Dry mount press and tacking iron Paper cutters Two types of transparency production equipment 16mm camera 8mm camera Rapid process camera Equipment for darkroom Spirit duplicator Primary typewriter Copy camera and stand	

	Basic	Advanced
	Light box	
	35mm still camera	
	Film rewind	
	Film splicer (8mm and 16mm)	
	Tape splicer	
	Slide reproducer	
	Mechanical lettering devices	
	Portable chalkboard	
Items for special consideration	Large group instruction	
	The following equipment should be available for each large group instructional area:	
	10x10 overhead projector, auditorium type; large screen with keystone eliminator; 16mm projector, auditorium type (consideration should be given to the possible use of rear screen projection)	
	Television	
	A complete distribution system of at least six channels should be available in a building so that: broadcast TV 2500 MHZ, UHF, or VHF can be received; signals can be distributed to each room from the central TV reception area and/or from a central studio; signals can be fed into the system from any classroom; signals are available simultaneously.	
	3¼x4 projectors	
	If still used by teachers at the school building, there should be 1 per school building plus 1 auditorium type per each large group instructional area.	

Basic	Advanced
	Equipment to make tele-lecture available

Chapter five describes media center facilities such as the environment, location, space, and equipment of the center.

Educational Facilities Laboratories[6] encourages and guides constructive changes in school and college facilities. Facilities should be more sensitively designed to the needs of education in a period of rapid change in instruction and social conditions. E.F.L. has advanced the notion of flexibility of design. A host of reports are available to people making decisions in the education construction market. While these reports call for change, credibility has been maintained with architects, engineers, the building industry and equipment manufacturers.

Findings---Survey of Teachers and Administrative Needs

All secondary teachers and administrators of a large suburban school district were surveyed, two junior high schools and one senior high school, making a total of three buildings. From a total of 146 possible responses 146 responded for a one hundred per cent response. This represents 1,113 years in education with an average of 7.6 years of experience. The results of this survey are contained in the following tables.

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[6]The Purposes and Activities of Educational Facilities Laboratory, (Washington, D. C., National Education Association, 1973).

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Teacher frequency response (one response per item) Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Bulletin Board	65	38	29	14
Chalk Boards (linear feet used) 10-20-30-40-50 circle one	106	28	8	4
Copying Machine	32	62	30	12
Dictionary and Atlas Stands	18	13	24	91
Exhibit Cases	12	14	38	82
Filmstrip Projector	8	32	47	59
Filmstrip Projector (auditorium type)	4	11	19	112
Folding Maps	10	15	14	107
Globes	6	13	29	118
Intercom System	16	7	18	105
Maps and Charts	20	23	23	80
Microfilm/Microfiche Reader	4	6	14	132
Microphones	2	11	19	114
Opaque Projector	1	12	48	85
Overhead Projector	15	27	43	61

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Teacher frequency response (one response per item) Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
P. A. System	25	13	19	89
Podium Lectern	81	12	10	43
Projection Cart	18	34	37	57
Projection Screen	15	49	39	43
8mm Motion Picture Projector	0	7	30	109
8mm Film Loop Projector	3	7	18	110
16mm Motion Picture Projector	4	39	49	54
Radio	2	11	22	111
Record Player	13	35	51	47
Recorder/Player for ¼" Tape	8	14	34	79
Recorder/Player Cassette	5	17	27	97
Slide Projector	33	10	47	86
Sound system wired to projector stations and building intercom	2	0	15	129
Spotlights	4	11	66	65

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Teacher frequency response (one response per item) Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Seldom Used 4
Tack Boards	15	14	23	94
Tape Player ¼" Tape	6	10	19	111
Tape Player Cassette	4	14	20	108
Telephone	16	19	14	97
Television	10	4	15	117
Television (auditorium type)	5	5	8	128
Typewriter	39	30	35	42
Video Tape Recorder	4	5	21	116
Book Depository	11	6	25	104
Card Catalog	10	20	35	81
Filing Cabinets	90	15	18	24
Reference Tables	36	24	26	60
Stacks for books and magazines	36	23	30	57
Storage	85	11	13	37
Storage Bins	46	13	10	77
Storage Cabinets	91	17	6	32

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Teacher frequency response (one response per item) Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Storage Facilities	79	17	7	43
Tables	72	19	10	45
Acoustical Treatment	28	3	4	111
Carpeting (acoustical treatment)	26	1	7	112
Chairs and Tables	88	10	8	40
Comfortable Seating	55	11	7	73
Electrical Circuits	57	24	9	56
Exhaust Ventilation Fans	43	17	3	83
Fountain (cold water)	84	10	5	47
Light Control (electrical)	98	10	3	35
Light Control (natural)	79	8	1	58
Movable Chairs and Desks	79	12	2	53
Sinks (hot and cold running water)	63	9	2	72
Thermostat (conditioned air)	74	5	4	63
Utilities Gas	28	6	1	111

Comments:

The business department requested carpeting and electrical outlets that are raised from the floor.

The mathematics department requested coordinated chalkboards and circular chalkboards for departmental use.

The music department requests a stereo sound system on all recorders and record players.

The English department requests a room or area, supplied with the necessary equipment needed for student publications such as, the newspaper and the yearbook.

The home economics suite requires additional electrical outlets and exhibit cases for the courses taught.

Analysis of the data in the preceding table revealed the following additional findings. These findings are discussed in the following paragraphs. Machines used to project media are used sixty percent of the time except for the opaque projector which requires near total darkness. Microfilm and microfiche readers are not used because of the unavailability of microfiche materials. Presently a microfilm reader is available.

Audio equipment such as record players have the highest usage at seventy percent of the time. Language and English departments indicate the greatest usage. The one-quarter inch (¼") tape recorder is used every day by the language department. Cassettes are increasing in popularity because there is more commercial media being produced.

Chalkboards are used more than bulletin boards or tack boards. The average linear feet is thirty feet, however the math department

requires 43.6 linear feet.

Storage space is in highest demand. Eighty-four per cent of the return indicate the use of filing cabinets.

Of the environmental elements surveyed more teachers requested light control than acoustical control or conditioned air. These conclusions would indicate that media is being used in the instructional areas.

Comments

It is difficult to consolidate or summarize the above diverse results in tabular form containing finite data. The findings reported here are the bases upon which the model discussed in Chapter V was designed.

CHAPTER V

CONCLUSIONS

The purpose of this study was to develop a model in which media facilities can be designed as an integral part of a proposed large suburban high school.

The researcher surveyed extensively the literature that had any relationship to the problem. Data about the community, students, population, size of faculty and curriculums offered was obtained from the Plum Borough School District. Trends and innovations in facilities design were obtained from related literature studied. The school architect was consulted for his recommendations and suggestions. A survey to determine to what extent media facilities were being used was conducted. This was necessary to obtain user data which was analyzed and utilized in the final report.

Theoretical Hypothesis

A media facilities model can be designed for a proposed large suburban high school.

Decisions

Based on the findings in Chapter IV the following elements have been designed and adapted for our model.

1. From the very beginning the potential user of the building must be consulted. This inquiry should be conducted by the media director if the use of media is to share a place of importance with the

many other considerations necessary in planning a building.

2. The school board and administration are responsible for providing improvements to meet the educational needs of the students. To best satisfy these student needs the school board and administration must project student enrollment, exercise sufficient planning, secure a method of financing, and complete the building on time.

3. Improvements in equipment and the rapidly expanding educational technological field make media facilities propitious to change. Certain facilities are less conducive to change than others. Flexibility should be incorporated in the design to accommodate these changes.

4. The teachers and administrators are interested in planning for the use of media in their instructional areas. They are very cooperative and responsive to inquiries about the use of media facilities.

Revised Decision Rules

As stated in Chapter III, page eighteen, the decision rules prepared during the design phase would be subject to revisions based on the findings reported in Chapter IV if the need arose.

The findings suggested the following revised decision rules which form a part of the model designed here.

1. Include items for "departmental use only" on these items requested by one-third or fewer teachers in a department, or it will be assigned to a restricted number of classrooms. Where certain items are requested by a particular department those items will be placed only in that department. Where an item is portable, they will be placed in a central storage area where those teachers who need them can obtain them.

2. Where a majority of the teachers of a department want an item or items and the items are non-portable, they will be placed in every room so that the teacher assigned to that room may or may not use them as the teacher chooses.

3. The average of the linear feet requested for chalkboard will be installed in each room, but a minimum of one chalkboard and one bulletin board will be installed in each classroom. Consideration will be given math and science classrooms for special chalkboards. Bulletin boards will be installed in many other areas as requested. Additional portable chalkboards and bulletin boards will be available to those who need them from the media coordinator.

4. Projectors, record players and tape recorders will be assigned on the basis of average requests for teachers in that department. But the Standard for School Media Programs and Guidelines for Instructional Media Services Programs recommended minimum standards for materials and equipment will be used to insure optimum equipage.

5. For example, facilities needed for projecting visuals---power outlets, drapes for light control, and screens will be installed in all instructional areas. Also ceiling television mounts will be installed in these areas.

6. Some equipment such as copying machines and typewriters would best be located in a central area for use by departments.

7. Standards on environmental factors will be followed to insure proper lighting, heating and cooling, movement of air, electrical power, and acoustical treatment.

These revised decision rules were used to develop the model which follows:

Plum Borough Media Facilities Model For A Proposed Large Suburban High School

I. In all classrooms the standard equipment will include:

One teacher's desk
One four drawer legal filing cabinet
One podium lecturn
Twelve linear feet of shelving
Eight linear feet of bulletin board
Thirty linear feet of chalkboard
Window drapes
Adequate light control
Two electrical outlets per wall (20 Amp 110V-AC for simultaneous equipment operation)
Wiring for two-way video system (Classroom to television studio and return)
Ceiling mounts for television receivers
One 24" television receiver
50" x 50" permanently mounted projection screen (with provision for keystone elimination)
One overhead projector and cart
Thirty movable chairs and desks
Acoustical controls, tile, plaster, rugs, insulation baffles, and wall coverings
Intercom system to and from administrative suite
Thermostatic climate control

In addition to the above standard equipment the following specifications for classrooms of the various special areas of the curriculum are to be employed.

A. The mathematics classrooms will require forty-four linear feet, green coordinated steel-backed chalkboards with map rails to aid instruction.

B. The language laboratory encompassing eight hundred square feet will be equipped with thirty carrels and chairs. One wireless twelve channel cassette classroom broadcaster and thirty audio passive headsets will assist the standard classroom equipment. The following

media equipment will be available to the language laboratory teacher from the media center:

16mm sound motion picture projector.....	1
8mm film loop projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
35mm sound filmstrip projector.....	1
Opaque projector.....	1
Record player.....	1
Projection cart.....	1

Additional equipment can be obtained by a request sent to the media director.

C. The science suite will have one classroom of eight hundred fifty square feet, nine laboratories containing 1125 square feet each, and three student project rooms of two hundred twenty square feet making a total of 8,535 square feet. The biology, chemistry and physics laboratories will also be used as classrooms and will have the standard media equipment. The following listed media equipment and facilities are needed in the science suite:

16mm sound motion picture projector.....	1
8mm film loop projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
Opaque projector.....	1
Record player.....	1
Tape player.....	1
Microprojector.....	1
Microscopes.....	1

The science laboratories will need these special facilities as listed:

Exhibit cases
Charts
Storage cabinets
Laboratory tables and chairs
Exhaust ventilation fans
Sinks
Natural gas

D. The business suite will contain one classroom at 850 square feet and two typing rooms containing 1125 square feet, making a total of 3,100 square feet. The department will have one wireless nine channel cassette classroom broadcaster and thirty audio passive head sets assigned to them.

The following media equipment will be available to the business teachers from the media center:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
Record player.....	1
P. A. System.....	1
Tape player.....	1

The business department will need these special facilities as listed below:

Typewriters.....	60
Charts.....	6
Extra power outlets (raised from floor)..	60
Copying machine.....	1
Duplicating machine.....	1
Paper cutter.....	1

E. Three arts and crafts rooms 1,000 square feet each making a total of 3,000 square feet. The following media equipment will be available to the arts and crafts teachers from the media center:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
Opaque projector.....	1
Record player.....	1
Radio (AM-FM).....	1

The arts and crafts area will also need these special facilities:

Additional electrical outlets
Natural gas
Sinks
Exhibit cases

F. The homemaking suite will have three teacher stations containing 1,000 square feet each, with a total of 3,000 square feet. The rooms to be equipped as for regular classrooms. The following media equipment is to be located in these rooms:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
Opaque projector.....	1
Record player.....	1
Carts.....	3

The homemaking suite needs the following additional facilities:

Additional electrical outlets
Natural gas
Sinks
Exhibit cases

G. There will be three industrial arts shops 2,400 square feet each. One planning and storage area containing 1,000 square feet for a total of 8,200 square feet. All shops are to have standard media facilities as listed for classrooms. The shops are to have self contained public address systems connected to all areas. A telephone to be installed in the industrial arts office:

The following media equipment is to be assigned to industrial arts and housed there:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
2" x 2" slide projector.....	1
8mm super film loop projector.....	1
35mm sound filmstrip projector.....	1

Additional equipment can be obtained by a request to the media director.

H. The music room will contain 1,500 square feet and the following listed facilities:

Teacher's desk
Four drawer legal filing cabinet
Podium lecturn
Twelve linear feet of shelving
Eight linear feet of bulletin boards
Sixteen linear feet of special chalkboard
Window drapes
Adequate light control
Three electrical outlets per wall
Wiring for two-way video system. (classroom to television studio and return)
Ceiling mounts for television receivers
Two 24" television receivers
50" x 50" permanently mounted projection screen. (with provision for keystone elimination)
Seventy five movable chairs
Seventy five music stands
Acoustical controls: tile, plaster, rugs, insulation baffles and wall coverings
Intercom system to and from administrative suite
Thermostatic climate control
Storage area
Sink and water fountain
Music library
Reed dispenser

The following media equipment is needed:

Stereo record player
Stereo tape player
Overhead projector and cart

I. The <u>english</u>, <u>social studies</u> and <u>geography</u> classrooms will have the standard equipment listed for regular classrooms.

II. A special feature of this model is its provisions for extensive use of media for instruction and learning, its elements include:

A. The following equipment will be available and zoned for regular classrooms. The availability will be on a per teacher basis:

16mm sound motion picture projector..... 8
8mm super film loop projector..... 1
35mm filmstrip projector..... 10
35mm sound filmstrip projector..... 3
2" x 2" slide projector..... 5
Opaque projector..... 2
Record player..... 20

¼" reel to reel tape recorder..... 3
Cassette players..... 3
Projection carts..... 30

Additional equipment needed to meet the multimedia approach which good teaching and effective learning requires may be requisitioned from the media director. This equipment is housed in the media center.

B. There will be two instructional planning centers of 425 square feet each. These rooms will be located near the classrooms and used for planning. The rooms to contain production equipment is listed:

Typewriter..... 1
Copying machine..... 1
Duplicating machine..... 1
Paper cutter..... 1

Additional production will be done in the media center.

C. The learning resource center and television studio will be centrally located on the first floor. The learning resource center is to occupy 4,000 square feet and the television studio to cover 2,000 square feet for a total of 7,000 square feet.

D. One classroom to be included in the media center and to have the standard facilities listed for a regular classroom.

E. The learning resource center will have the following equipment:

Exhibit cases
Globe
Charts
Microfilm/microfiche readers
Tack board
Telephone
Typewriter
Book depository
Card catalog
Filing cabinets
Stacks for books and magazines
Fountain (cold water)

Sink
Storage facilities
Charging desk
Charging machine
Book trucks
Adding machine

Carrels equipped with power and capability of electronic response systems and television outlets.

One nine channel cassette classroom broadcaster with ten headsets.

F. Production area to house the following graphic production equipment:

Dry mounting press
Laminating machine
Typewriter
Copying machine
Duplicating machine
Paper cutter
Photo enlarger
Lettering devices
Ekta Graphic Visual maker
Transparency machine

G. The following media equipment will be housed in the media center and available upon request from the media director:

16mm sound motion picture projector.....	18
8mm super film loop projector.....	5
35mm filmstrip projector.....	23
35mm sound filmstrip projector.....	6
2" x 2" slide projector.....	23
Opaque projector.....	5
Overhead projectors.....	12
Record players.....	30
Tape recorders.....	20
Cassette players.....	20
Television receivers.....	12
Microphones and stands.....	6
Speakers.....	6
Amplifiers.....	3
Portable screens.....	12
Portable tables.....	57
Portable spotlights.....	2
Video tape recorders.....	4
Video tape players.....	4

H. The television studio adjacent to the learning resource center is to have 2,500 square feet. The following recommendations are made first to the architect and second to the television engineer.

Items recommended to the architect:

1. Studio clock inside control room-above console and one clock in studio.
2. Control room to be elevated above studio as high as two feet. Floor in control to allow room for video and audio cables.
3. Ceiling in studio to be twelve feet or greater, closer to eighteen feet is better.
4. Studio and control room to be sound proof.
5. General lighting in studio plus lights suspended on tracks or grids to provide in hampered mobility of camera and to increase the amount of operational floor space for production. Production lights to be quartz colortron to provide one hundred foot candles. Lights to be controlled in the control room.
6. Studio floor should be smooth and hard. Concrete floor covered with sheet material, no seams, color gray, no pattern in it.
7. Suitable backdrops of gray or gray blue, mounted on travis systems in areas of the studio where programs are to originate.
8. Air conditioning to handle heat from lights used in studio and to help keep equipment cool in control room.
9. Receptacle outlets for video outside control room. Audio receptacles around studio walls. Adequate 110 power receptacles throughout studio. Video outlets on opposite walls and mike outlets on all walls.
10. On the air warning lights outside studio, activated by microphone and to disconnect school public address system off in studio.
11. Telephone in control room and extension phone in storage room to right of studio, lights on telephone, no bell.
12. Storage shelves in rooms to house videotapes, cabinets with locks to house microphones and cables.
13. Studio doors to have double locks for extra security.
14. Door on storage room to have full height of ceiling.

Items recommended to the Television Engineer:

1. Recommend 3/4" U-Matic Videocassette System, black and white studio color receiver.
2. Three floor television cameras, one to be self contained and one rover or portable camera.
3. One film chain for 16mm film and 35mm carousel slides, remote controlled on console.

4. Two 3/4" videocassette recorders, both to be color with electronic editing on one.
5. One control console for video with a minimum of four special effect and a switcher fader.
6. One control console for audio to contain one turn table, two tape decks for ¼" cartridge tapes. One tape deck to have recording and playback. Console to have a minimum of six microphone inputs for lavalier and stand microphones. Intercom system between director, floor manager, camera men and other personnel in studio by way of headsets, also by way of a speaker which is controllable, shure microphones.
7. Modulator to cable, relay equipment, dual channel frequency to permit on the cable and closed-circuit transmission in the building.
8. Monitor for all cameras, film chain and line monitor. One good color monitor to record live broadcast programs.
9. All television and audio equipment to be solid state.
10. Classrooms and other special areas equipped with two-way ITV connector Jerrold J-Jacks for two-way service connections. Two camera capability in gym and auditorium.
11. Television receiver twenty-four inch, solid state, speaker in front, good quality of picture and sound, mounted on window side of wall and tilt table. Receivers to have hidden controls and extra large speaker.
12. No viewer should sit farther away from a television screen than approximately twelve times the width of the image. The minimum distance is that the viewer should be seated not closer than approximately three times the width of the image. Maximum viewing angle should not exceed thirty degrees. Horizontal viewing angle may be as high as ninety degrees, forty-five degrees on each side of the axis perpendicular to the television screen. Television receivers should be elevated for unobstructed viewing. The height recommended is a minimum of five feet from the bottom of the television screen to the floor.

III. The following special school wide instructional areas to be equipped for media use:

A. The main gymnasium area will encompass 7,500 square feet floor area, the swimming pool 7,500 square feet, the auxiliary gymnasium 2,500 square feet, the remedial gymnasium 1,000 square feet, the girls' locker room and shower room 2,400 square feet and the boys' locker room 2,400 square feet, the total area will be 23,300 square feet.

1. The girls' and boys' locker rooms will have instructional facilities to conduct health classes as listed below:

Sixteen feet of green chalkboard
Eight linear feet of bulletin board
Adequate light control
Electrical outlets
50" x 50" permanently mounted projection screen

The following media equipment will be available to the health and physical education teacher from the media center:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
35mm sound filmstrip projector.....	1
2" x 2" slide projector.....	1
Opaque projector.....	1
Cassette player.....	1
Record player.....	1
Projection carts.....	3

2. A public address system will be installed in all gymnasium areas, with inputs at positions where coaches and instructors will be using them. The system should be able to accommodate record players, tape recorders and a radio. Television outlets should be installed for double camera coverage of athletic events, connected back to the television studio for video taping of programs. A spotlight should also be available to cover special events.

B. The auditorium will have movable, soundproof walls to divide the available space into smaller instructional areas. The smaller areas must be equipped for the use of media as the regular classrooms. The auditorium, as a larger unit, will need the following important facilities for media use.

Switches for light control
Stage to booth communications

Public address system with lock
MARC 300 arc light 16mm projectors
Heavy duty electric circuits
Wiring for two-way video system (auditorium to television studio and return)
Electrical operated roll up screen 20'x20' with locking device
Motorized stage curtain with locking device
Arc spotlight

C. The cafeteria dining area will contain 7,500 square feet, faculty dining 540 square feet, kitchen and storage 4,200 square feet, making a total of 12,240 square feet. Flexible spaces in the dining area should contain facilities for a variety of instructional uses. These spaces to contain the standard media facilities as the following:

One podium lecturn
Portable chalkboard
Sixteen linear feet of bulletin board
Window drapes
Adequate light control
Adequate electrical outlets on walls and in floor
Wiring for two-way video system (cafeteria to television studio and return)
Acoustical controls: tile, plaster, insulation baffles and wall coverings
Public address system with several microphone plugs around wall area
Thermostatic climate control

The following media equipment will be available to users of the cafeteria area from the media center:

16mm sound motion picture projector.....	1
35mm filmstrip projector.....	1
35mm sound filmstrip projector.....	1
2"x2" slide projector.....	1
Opaque projector.....	1
Overhead projectors.....	3
Television receivers.....	4
Portable movie screens.....	4
Record players.....	3
Carts.....	20

D. The health suite to contain 850 square feet with the following facilities:

Eight linear feet of bulletin board
Telephone
Filing cabinets
Storage facilities
Acoustical treatment
Exhaust ventilation fans
Light control
Fountain (cold water)
Sinks
Intercom system
Electrical circuits

E. The administrative suite will consist of the following:

1. Space

Principal	150 square feet
Conference Room	150 square feet
Files and Circulation	100 square feet
Office Waiting Area	220 square feet
Guidance Waiting Area	100 square feet
Storage Vault	230 square feet
Staff Members (6)	720 square feet
Clerks (3)	360 square feet
Total	2030 square feet

2. An automatic clock system with bells or chimes and manual override will be provided and a telephone switchboard for the building.

3. An intercom system with AM-FM tuner, a record player, a 100 watt all call amplifier, and switching for 100 rooms. The intercom unit will allow individual communication with any room without disturbing classes in the rooms with which you do not wish to communicate.

4. A portable public address system will be available to be used in emergencies in and out of the building. The following items will also be located in the administrative suite:

Typewriter	1
Copying machine	1
Duplicating machine	1
Filing cabinets	36

Desks..... 12
Exhibit cases..... 2

F. Two conference rooms each 420 square feet, two student activity rooms each 425 square feet, two seminar rooms at 425 square feet for a total of 2,540 square feet, will further enhance the first floor complex. These rooms to contain the following facilities:

Eight linear feet of bulletin board
Four linear feet of chalkboard
Intercom system
Podium lecturn
Twenty-four inch television receiver
Chairs and tables
One electrical outlet on each wall

IV. Other recommendations:

A. Photographic darkroom facilities

B. Large screen television in auditorium

C. Electronic retrieval system

D. Learner response system

E. Electronic security system for print material

Discussions

The four part model described above is recommended for a high school of fifteen hundred students in a suburban area encompassing thirty square miles, and where the median income is $14,000 per annum earned by mostly eighty percent (80%) blue collar workers.

Part one of the model provides for standard equipment in the classroom, and it is based upon the survey data provided by teachers as well as recommendations of authorities on median amounts of space and equipment. Part two is concerned with the distinctive feature of this model mainly extensive use of media for instruction and learning. These

elements seek to provide for what is regarded as the latest mediated equipment. Part three is concerned with those diverse facilities that might be regarded as school wide. Part four consists of several items which are recommended for inclusion in the design of the building.

The nature of this model is to provide a school plant with thorough going media facilities for a comprehensive and special curriculum designed for a suburban high school in which approximately fifteen hundred students attend. The students come from a thirty square mile area populated to the extent of eighty per cent (80%) by blue collar workers, their income is such that might be regarded as middle class, economically speaking. A sufficient number of students go on to college or prepare for the various trades and skills for the metropolitan area in which this community lies. Plum Borough is a part of the metropolitan area of Pittsburgh, Pennsylvania.

Limitations

It is conceivable that there are other school districts of this type in the demographic situation role in a metropolitan area which may find this model useful. It should be remembered that emphasis in this model was on preparation of a media facilities design appropriate to specified student population and instructional population and for a curriculum of this particular type for a suburban school district in this specific metropolitan area. Adaptation of this model can easily be made for other similar situations.

Suggestions for Further Study

1. A comparison study of this model with existing facilities in

a comparable district might be desirable.

2. Similar models should be constructed at the elementary and junior high levels.

3. A complete financial work-up should be prepared for this model.

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APPENDIX A

SECONDARY SCHOOL MEDIA FACILITIES SURVEY

Secondary Schools
Media Facilities Survey

Date_____

Subject Taught_____ How Long_____

Media facilities for a proposed new high school are in the planning stages. Your assistance and cooperation are needed to determine to what extent facilities are being used at the present time.

Directions: Respond to each item on the checklist by indicating with an "X" in the proper column. If a media facility is used constantly (Daily) place an "X" in column one (1), if used periodically (Weekly) place an "X" in column (2), if used seldom (Monthly) mark column three (3), and if never used mark column four (4). Mark only one column in each category. If an item is inappropriate draw a line through it. Add other items and comments in the spaces provided at the end of the chart.

EXAMPLE:

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Podium lecturn				
Chalkboards				
Television				

Check the department area where facilities and resources will be used.

1. _____ Regular Classroom
2. _____ Other Classrooms
3. _____ Science
4. _____ Business
5. _____ Arts and Crafts
6. _____ Homemaking
7. _____ Industrial Arts
8. _____ Music
9. _____ Media Center
10. _____ Television Studio
11. _____ Gymnasium (including locker rooms)
12. _____ Auditorium
13. _____ Health Suite
14. _____ Faculty Rooms
15. _____ Conference Room
16. _____ Student Activity Rooms
17. _____ Seminar Rooms
18. _____ Cafeteria
19. _____ Administrative Suite

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Bulletin board				
Chalkboards (linear feet used) 10-20-30-40-50 (circle one)				
Copying machine				
Dictionary and Atlas stands				
Exhibit cases				
Filmstrip projector				
Filmstrip projector (auditorium Type)				
Folding maps				
Globes				
Intercom system				
Maps and charts				
Microfilm/microfiche reader				
Microphones				
Opaque projector				
Overhead projector				
P. A. system				
Podium lecturn				
Projection cart				

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Projection screen				
8mm motion picture projector				
8mm film loop projector				
16mm motion picture projector				
Radio				
Record player				
Recorder/player for ¼" tape				
Recorder/player cassette				
Slide projector				
Sound system wired to projector stations and building intercom				
Spotlights				
Tack boards				
Tape player ¼" tape				
Tape player cassette				
Telephone				
Television				
Television (auditorium type)				
Typewriter				

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Video tape recorder				
Book depository				
Card catalog				
Filing cabinets				
Reference tables				
Stacks for books and magazines				
Storage				
Storage bins				
Storage cabinets				
Storage facilities				
Tables				
Acoustical treatment				
Carpeting (acoustical treatment)				
Chairs and tables				
Comfortable seating				
Electrical circuits				
Exhaust ventilation fans				
Fountain (cold water)				

TECHNOLOGICAL FACILITIES AND RESOURCES

Item	Constantly Used (Daily) 1	Periodically Used (Weekly) 2	Seldom Used (Monthly) 3	Never Used 4
Light control (electrical)				
Light control (natural)				
Movable chairs and desks				
Sinks (hot and cold running water)				
Thermostat (conditioned air)				
Utilities gas				
Others:				

Comments:

APPENDIX B

LETTERS CONFIRMING CONTENT VALIDITY

University of Pittsburgh
UNIVERSITY OF PITTSBURGH LIBRARIES
Communication Center

October 31, 1974

Mr. James R. Rainey
Media Specialist
Plum Borough Schools
4755 Havana Drive
Pittsburgh, PA 15239

Dear Mr. Rainey:

In response to your request for my reaction to the media survey you have developed, I am willing to assume that information gathered on the extent facilities are being used at the present time will provide a useful index to future requirements. However, it seems to me that you would also need to know something about the possible demand for equipment and facilities not presently available to formulate any type of future plan. I would think that you would want to ask a different kind of question in order to get at the "would you use it if you had it" type of situtation.

The survey list, as you have it, looks like a rather good set of items. It may be helpful, however, for you to group the items by some function. It seems confusing, to me, to attempt to compare the use of carpeting with the use of overhead projectors. There may also be a problem in interpreting the scale over the set of items. In other words, several hours a day may be required before one is willing to consider "comfortable seating" as being in "constant use." A motion picture projector, on the other hand, may be considered to be in "constant use" if used in class once a week.

The three suggestions that I have for your survey, Jim, are:

1. Make provisions for new items that may be useful and are in addition to those now in the system.

2. Group facility and convenience items separately from equipment items.

3. Specify the criterion levels that distinguish the constantly used level from the periodically and seldom used levels.

Best wishes on your project, if you wish to discuss any of the above, please feel free to give me a call.

Sincerely,

Richard Gerrero, Ph. D.
Assistant Director

ak

PITTSBURGH, PA 15260

LOCK HAVEN STATE COLLEGE
LOCK HAVEN, PENNSYLVANIA 17745

November 1, 1974

James R. Rainey
Media Specialist
Plum Borough Schools
4755 Havana Drive
Pittsburgh, Pennsylvania 15239

Dr. Chick O. Empfield
Assistant Professor
410 Raub Hall
Lock Haven State College
Lock Haven, Pennsylvania 17745

Dear Jim:

I trust that my comments will be taken constructively and are in line with your request. My comments are as follows:

Page One Directions--I feel it would be necessary to specify the terms "constantly", "periodically", "seldom" used. It might be advisable to state a frequency number as the number of times used per week or perhaps the approximate number of minutes per week. (Example:more than ten times per week, eight-ten times per week, five-seven times per week, one-four times per week, never, etc.)

Page Two Department Area--It isn't clear to me what area would be checked by an instructor in a specific subject area. Would he check only the primary subject area or regular classroom or perhaps several checks to indicate all areas in which the resource items would be used?

Pages Three-Four Checklist--There are a number of items on the checklist that don't appear to be relevant or significant to the task required. Perhaps the terms "facility" and "resources" aren't clearly understood by me. It is difficult for me to comprehend how terms such as "carpeting", "fans", "coin changers", and "etc." are used in relation to instructional media facilities or resources.

Generally, I feel there is a basis for a good checklist, one that would be valid. However, there are several areas that need to be clarified. I can appreciate the amount of work involved in preparing a checksheet of this nature. There does appear to be areas that should be clarified for your faculty members so that your results will not only be manageable but also be consistent with your purpose.

If I can be of any further assistance, please don't hesitate to write or call.

Sincerely,

Chick O. Empfield

ALLEGHENY INTERMEDIATE UNIT

Suite 1300 - Two Allegheny Center - Pittsburgh, Pa. 15212
(Area Code 412) 321-5700

Instructional Materials Services

November 7, 1974

Mr. James R. Rainey
Media Specialist
Plum Borough Schools
4755 Havana Drive
Pittsburgh, PA 15239

Dear Mr. Rainey:

In response to your letter of October 8 re: your media model it seems you have an excellent check list for this project. It should provide you with worthwhile data.

Do you assume that all high school teachers have these facilities and resources already available? If so fine, but if a teacher does not have the facility available will it cause you problems in determining validity?

Being new to the state (I arrived via Baltimore, MD in July) I would suggest examining any existing state codes or criteria for media facilities. Does such a criteria now exist and would you have to comply with the requirements?

Please excuse my lateness in answering your letter. I would be interested to hear from you on the results of your survey.

Sincerely,

James C. Hoke

James C. Hoke
Assistant Director, IMS

JCH/jr

ALLEGHENY INTERMEDIATE UNIT

Suite 1300 - Two Allegheny Center - Pittsburgh, Pa. 15212
(Area Code 412) 321-5700

Instructional Materials Services

November 1, 1974

Mr. James R. Rainey
Media Specialist
Plum Borough Schools
4755 Havana Drive
Pittsburgh, PA 15239

Dear Jim:

I've looked over, at length, your "Media Facilities Survey" and if you'll excuse some random thoughts, I'll throw them at you in just that arrangement.

1. I thought I understood your purpose from the first paragraph but was confused by some of the items on the "resource" list. To me, some of the items listed don't fall into the category "Media Facilities" but instead into "Physical Plant." Why include them? The level of control of such things is certainly at an administrative not a teacher level.

2. If you're trying to establish a hardware model I might suggest categories such as the classification areas in the NAVA "Audio-Visual Equipment Directory." If your goal is architectural, I'd look toward some of the stuff from the Educational Facilities Laboratory.

I don't know that I've been that helpful Jim, but if our sitting down at length, over a cup of coffee will be more useful, I'm at your disposal.

Best of Luck.

Regards,

Robert P. Obrosky
Director, IMS

RPO/jr