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ABSTRACT

For the abstract of the Final Report, see ED 042 064 in this issue of RIE. (LS)

A STUDY OF

# THE IMPACT OF RESEARCH ON UTILIZATION OF MEDIA FOR EDUCATIONAL PURPOSES

SPONSORED BY

## NDEA TITLE VII 1958-1968

**FINAL REPORT : OVERVIEW**

ROBERT FILEP AND WILBUR SCHRAMM

July 15, 1970

United States Office of Education
Contract No.
OEC-0-9-420246-3462(010)

ACKNOWLEDGEMENTS

The undertaking of a project such as this requires, by its very nature, the commitment and concern of many people.

Every research project should be as fortunate in its Advisory Committee and senior consultants, all of whom exhibited dedication to their task and a composite wisdom. Their perceptions and expertise permeate the substance and spirit of this report, and to a certain degree suggested the *Modus Operandi* for this effort.

This overview is based upon a much longer final project report and for those who are interested in additional, in-depth information about the study, attention is directed to Filep, R. A Study of the Impact of Research on Utilization of Media for Educational Purposes Sponsored by NDEA Title VII, 1958-1968: Final Report, El Segundo, California, Institute for Educational Development, July 15, 1970.

Adolph Koenig and Andrew Molnar of the U.S. Office of Education functioned as Advisory Committee members and constructive critics of the project from its inception. Their unique knowledge, based upon their day-in, day-out involvement with Title VII, has been invaluable. Other USOE personnel such as David Pollen, James McPherson, and Carlos Stewart also have facilitated this work. In addition, former USOE personnel who were directly involved with Title VII have given willingly of their time. A USOE member and former Title VII staff person, Thomas D. Clemens, was of inestimable help to this project. His ability to recapture and relate both the sacred and profane aspects of Title VII was unmatched. There is no question in the minds of many who have been associated with Title VII that his dedication and creative management were in great part responsible for many of Title VII's successes. Their viewpoint is shared by these authors.

Valued guidance in the legislative history area was tendered by Charles A. Quattelbaum, specialist in education, on the staff of the Senior Specialist Division of the Legislative Reference Service in the Library of Congress. Other legislative personnel involved with the origin of Title VII who gave generously of their time included: Frederick R. Blackwell, Staff Counsel--Subcommittee on Labor, U.S. Senate; John Forsythe, General Counsel--Senate Labor and Public Welfare Committee; Stewart E. McLure, professional staff

member--Senate Committee on Public Works; William G. Ready, Director, Washington Office--National Assembly for Social Policy and Development; and Jack Duncan, Counsel for the Select Subcommittee on Education--U. S. House of Representatives.

Additional valuable data sources developed as the project progressed, such as those contributed by the ERIC Clearinghouse on Educational Media at Stanford University which provided, as needed, access to and assistance with various source data. The two hundred and twenty-nine former Title VII directors who responded to our call for information were an excellent resource.

Harold Mitzel and Edward Cohen were both most gracious in arranging site visits to their campuses at the Pennsylvania State University and Indiana University, respectively and in making available reports about Title VII related activities. James H. Beaird, L. C. Larson, and Charles F. Schuller provided detailed information regarding their departments and groups. The members of the Educational Media Council, during their May, 1969 meeting, provided invaluable guidance and ideas. Miss Claire List of The Ford Foundation shared information with the staff regarding the Foundation's work on educational television.

Original source data for a number of chapters in the final report were supplied by several individuals working at various times on the project staff. In each instance, their contributions have been carefully modified and amplified under the aegis of the project director. Those who provided information, analyses, etc., for the quarterly reports of the project include: William H. Allen; Carol Aslanian; Henry T. Ingle; Douglas Hall; Colin K. Mick; Harriet Miller; George Rawalt; and Margaret C. Snyder.

The authors also wish to acknowledge the latitude and freedom afforded by Sidney P. Marland, IED's president and Project Principal Investigator to pursue the project with minimal constraints and occasional guidance. His contributions as an Advisory Committee member were invaluable; his constructive advice and counsel in his role as "Captain" of IED's ship were always timely and on target.

This task was started early in the Spring of 1969 and the unfortunate death of Dr. James D. Finn, Chairman of the Department of Instructional Technology at the University of Southern California, at that time, deprived the project of the benefit of his involvement. His Gaelic wit and wisdom were sorely missed. In the sense that he was a key participant (both directly and indirectly) in many of the Title VII

projects, his influence was ever present in this assessment. By virtue of being a great teacher, and one of the first who saw the potential benefits and shortcomings of technology in education, his influence has had an indelible impact on this endeavor.

Robert T. Filep
Wilbur Schramm

July 15, 1970
El Segundo,
Palo Alto, California

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# INTRODUCTION

The past is prologue--the events of the 50's and 60's inevitably will influence American society in the 70's as it educates its young. Thus, the federal legislation that was devoted to strengthening education during the 60's will also help to shape education during the current decade. This will be particularly evident in legislation dealing with new approaches to teaching and curriculum design and with a fuller school utilization of the knowledge derived from recent audiovisual and technological developments. To plan and cope with the advances to be made in education during the 70's, it is valuable to review what has gone before.

Until 1958, only two major pieces of legislation aimed at improving and strengthening American education on a broad front had become law.[1] In 1958, the National Defense Education Act (NDEA) was passed, marking a turning point in the history of federal aid to education and providing a base from which more ambitious and extensive programs would be launched in the 60's.

A study of the total effect of the National Defense Education Act would be both interesting and useful. Within the NDEA, however, the section identified as Title VII is of a more

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[1] *Some of the programs of the 1930's, including the CCC, WPA, and NYA legislation, had provided support for specialized training, and, in some cases, subsistence for students. The Lanham Act of 1941 was broadened in 1950 to help provide educational facilities and operating expenses to communities substantially affected by the proximity of large federal programs. The National Science Foundation was created in 1950 to assist and support research, graduate study, and symposia in science; and the Cooperative Research Act of 1954 was written to make possible more research and demonstration under the Office of Education. But these were more specialized than the two Acts we have mentioned. With the exception of the Morrill and Smith-Hughes Acts, from 1776 until 1958, there had been an unrelieved record of failure to legislate broad federal aid to education. The church-state issue, or fears for local automony, had always gotten in the way.*

manageable size for assessment and study than the total act, and has certain characteristics worthy of careful analysis and close scrutiny. Total expenditures under this title were $40.3 million for more than 600 projects over ten years. This is in contrast to well over a billion and one-half dollars spent and the thousands of projects supported under the rest of the act.

Administratively, Title VII is interesting because it was "categorical" legislation in support of research and the dissemination of the research findings in the fields of instructional media and technology. It did not provide, however, for large-scale "purchase of innovative materials, equipment, or facilities." Furthermore, it contained the unusual provision that a committee comprised of representatives from the lay and educational communities would evaluate proposals for research grants and contracts.

For the above reasons, and for the still more important factor that Title VII was closely related to the state of ferment characteristic of education during the late 1950's and 1960's, the U. S. Office of Education requested that this study of Title VII be conducted. The objective was to discover what can be learned from its impact and from the administrative problems involved in its implementation and operation. In addition, this study will serve to guide future legislation and future programs of a similar nature.

*The overall objective of this project was to review the research and dissemination activities carried out under Title VII between 1958 and 1968 and to assess the educational advances and changes made under its auspices.*

*This study also was conducted to assess the strengths and weaknesses of the administrative procedures required by the legislation. Specific recommendations are made regarding policies and practices for future programs of this nature.*

These objectives were investigated, analyzed, researched, and assessed by way of:

- Thorough research and analysis of the literature and similar data available on Title VII.
- On-site observation of selected institutions where a number of studies had been conducted under this title of the act.

- Distribution and evaluation of field and mail interviews of project directors and other personnel associated with Title VII.

- Convening an advisory group to assist in formulating assessment guidelines and recommendations for future policies.

Because Title VII can be neither adequately evaluated nor fully understood without considering it in reference to the educational activity prevalent in its time, one should first say something about the state of ferment characterizing the period.

Title VII
National Defense Education Act

HISTORICAL
OUTLINE

Passed by the House, 212 to 85, 131 not voting,
Passed by the Senate, 66 to 15, 15 not voting.

Signed into law by President Eisenhower,
September 2, 1958.

Designed to "encourage research and experimentation in the more effective utilization of television, radio, motion pictures, and related media" (including, by later amendment, printed and published materials).

Expended in 10 years some $40.3 million on approximately 600 grants and contracts.

Allowed to lapse on 30 June 1968, when its functions were authorized principally under other legislation.

## TITLE VII AND THE CHANGING NATURE OF AMERICAN EDUCATION

The years since Title VII came into existence in 1958 have been a time of unprecedented ferment in American education.[2] Much of this can be traced to the shock wave that went through the American people at the launching of the first Soviet Sputnik in October 1957. Much, but not all. The seeds of educational change and the subsequent dissatisfaction with the slowness of change had been planted long before.

A famous series of studies at Columbia Teachers College in the late 1930's had concluded that it took about 50 years--after method and materials had been thoroughly developed--to diffuse a new idea or practice through the American school system.[3]

By 1946, this estimate had been revised to 25 years.[4] Many critics, within and without the schools and colleges, had challenged the basic assumptions of the educational system and its effectiveness in teaching--among other things--basic skills in mathematics and science. The challenge of Sputnik to this growing questioning and reexamination was to suggest that the Soviet Union might be moving ahead of this country in the teaching of mathematics and science. This national concern and the wave of doubt it cast tended to bring to a focus the question of whether American education might need to be revitalized and improved by means of swift and vigorous action.

The challenges and demands thrown at the American educational system in those years of ferment were neither technical nor tactical: they were basic and broad in scope. They had to do with fundamental doubts concerning excellence--how good

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[2]Hoole, W. S. *National Defense Education Act: A Brief Chronology*, University of Alabama, unpublished manuscript, 1960. See also Wilson, C. E. *A Study of the Background and Passage of the National Defense Education Act of 1958*, University Microfilsm, 1960.

[3]Mort, P. R. and Cornell, F. G. *American Schools in Transition*. New York: Teachers College, Columbia University, 1941.

[4]Mort, P. R. and Pierce, T. M. *Measuring Community Adaptability*. School Executive, 1947, 66, pp. 35-36.

is American education compared to that of other systems, especially that of the Soviet Union?; relevance--how well is it meeting the needs of the American people, and of their different educational groups?; productivity--is there any rise in accomplishments and achievements in proportion to constantly and rapidly rising costs?; and accountability--what is being done to assess the system in terms of the above excellence, relevance, and productivity?

The response to questions of these kinds was a great deal of self-searching in the schools, a new interest within the scientific and scholarly community in contributing to the quality of education at all levels, and an impressive burst of activity (much of it financed by federal funds)--in revising curricula, preparing new materials, trying new technologies, educating and re-training teachers, and researching basic educational problems and methods.

Riding the tide of this educational upsurge and ferment, has been a main current of change in the form of a growing reliance on a systematic approach to education. The significance of this development can best be seen against the background of the traditional privacy of the classroom and the assumed self-sufficiency of the teacher.

In America, as elsewhere, the teacher has typically had to play an all-purpose role--lecturing, drilling, discussing, counseling, disciplining, course-structuring, record-keeping, and performing other activities. Even in highly-sophisticated educational systems, a teacher usually has been responsible for all of the teaching of one class of students, at least within the elementary school context. He or she has been expected to know the substance of the elementary curriculum--science, language, mathematics, social studies, communication skills, and fine arts. And, in addition, has had to serve as dean of students, examiner, counselor, and registrar of records.

These roles and the assumed self-sufficiency of each and every teacher to handle them competently, if not expertly, evolved from the tradition and fond nostalgia of the "one room schoolhouse." In those one room schools, a teacher often had to direct and supervise, if not teach, as many as eight grades, with the result that most teaching was by book and blackboard. The textbook usually governed the content of the curriculum and, in an early stage of the development of school systems, the teacher was also expected to serve as the textbook.

This heavy load of roles and the use of a teacher's time and responsibility have long been questioned and criticized. Edward L. Thorndike of Columbia University said in 1912, long before the major modern advances in educational technology, that "A human being should not be wasted in doing what 40 sheets of paper or two phonographs can do."[5] There has been a long history of effort to bring additional learning resources into the classroom and to encourage a variety of learning activities in addition to the traditional pattern of listen-study-recite. Increasing use of additional learning resources has grown partly out of the rising amount of attention and time being captured by the audiovisual media in American life, and the adaptation of these and other media as learning resources for the schools. For instance, U.S. children now spend about as much time watching home television during their first 12 or 15 years of life as they spend in school.

Another source for change in the teacher's role has grown out of the increased recognition and realization of the wide range of individual differences among students and from the attempt to cope with--and adapt and adjust to--these variations and other cultural, social, and intellectual differences.

Today's sophisticated learning resources bear a relationship to the traditional textbook as widely different as Apollo 13 is to the first flight by the Wright Brothers! The acceptance of the new resources has been so widespread that it is now difficult to imagine a classroom totally lacking in filmstrips, motion pictures, tape recorders, transparencies, overhead projectors, instructional television and radio, programmed self-instructional materials in many forms, practice kits, and similar devices. Such facilities not only enormously enrich the content of the curriculum, they also provide new techniques of working with it, as well as point to exciting ways in which the student can vary and guide his own study and practice. These innovations free the teacher from such time-consuming activities as individual language practice and arithmetic drill, and supplement his effectiveness in critical areas of his primary duties: teaching.

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[5] Thorndike, Edward L. *Education*. New York: The Macmillan Company, 1912, p. 167.

These new resources did not receive overnight acceptance. Instructional films, for example, have been available for many decades, but their use was negligible until the launching of Sputnik sparked an unprecedented concern and dissatisfaction with the learning devices and practices of the time. In 1958, the annual expenditure of elementary and secondary schools for audiovisual equipment was about $62 million; in 1968, it was about $253 million. In 1958, there were about 50 language laboratories in American secondary schools; in 1963, about 5,000. And still, the actual penetration of such teaching resources is very slight. The obstacles are many, including inappropriateness of materials, lack of funds and facilities, and defense of the classroom as the last bastion of humanism. The Commission on Instructional Technology, for example, reported recently that no more than five percent, and perhaps as little as one percent, of class hours in American schools, are presently given over to audiovisual instruction.[6]

Despite the slow growth, however, of new approaches like team teaching and the relatively slow acceptance of additional learning resources, the new role of the teacher is becoming clearer. Recently, this new role for the classroom teacher has been clearly and sharply defined as first and foremost that of an effective and enriched guide of learning rather than a "jack of all trades but master of none." This role is that of a manager of a system of learning activity within the classroom. No longer is the teacher expected to do everything. Rather, now he is expected to guide his students to the particular combination of learning activities and resources that best meet their needs at any given time.

To do this, the teacher needs support: resources such as movie projectors; language laboratories; instructional television and films; the chance to share knowledge about his specialties with other teachers; and the help of semiprofessionals with routine duties. Increasingly, the teacher is coming to think of his job as an educational specialist who channels, combines, and brings an interrelated system of learning resources to bear on the needs and interests of the students.

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[6] Commission on Instructional Technology. *To Improve Learning*. Committee on Education and Labor, House of Representatives, March 1970.

The trend of this system-related approach centers on the idea of individualizing instruction so that students can work at their own pace with maximum motivation as a general pattern of education. This has been accepted very slowly, because schools are typically organized for group rather than individual pacing. Nothing less than a completely revised curriculum and completely revised school procedures would make individualized instruction on a broad scale possible. In a few experimental schools, however, and within limited sectors of the curriculum, individualized instruction has made some progress. The ungraded school is becoming more common.

Programmed instructional materials have been the precursor to large scale individualized instruction. And these have had to follow an even rougher road to adoption, because excellent programs have been in short supply and also because the programmed instruction method directly challenges the very nature of instruction rather than merely affecting classroom efficiency. In fact, programmed instruction requires a statement of very specific performance objectives for teaching and assessment. Planning for instruction, testing, and accountability are central to such a programming process; the overall approach provides a strategy whereby a teacher can tell how well the program is doing, and both the teacher and the student can tell how well the student is doing. Performance contracting endeavors are one by-product of this approach.

This current argument for individualization of instruction parallels the movement toward upgrading and updating curricula, which gained so much impetus from Sputnik. If American students were not learning by the best and newest methods, especially in mathematics and science, why not? If many of them were going through school without really learning how to read, why not? Thus in these years of ferment, beginning in 1958, there has been a member of national curricular revisions involving leading scholars in each field, based on the original pattern of the Physical Science Study Committee. The "new math" has swept the schools, concerned attention has been given to finding improved ways to teach reading, and so on.

If the process of programmed instruction was harmonious with the movement toward individualization, then instructional films and television, improved text materials, and ingenious practice and demonstration devices were typical of the movement to update curricula. These were intended to bring learning experiences to the student that the teacher could not provide.

But it was found that to update curricula, it was necessary to update teachers too. Therefore, there has been intensive activity in teacher training and special attention given to teacher training institutions.

Throughout these developments, the calls for accountability have been heard more loudly and more insistently. These requests have been resisted bitterly by humanists and others who argue, with some justification, that the effects of education cannot, at least presently, be measured fully.

Accountability and evaluation have been accepted only grudgingly and reluctantly by school administrators who have to face the taxpayers. It has been resisted by teachers and makers of educational materials who fear unfavorable or uncomfortable comparisons. But the demand for an accounting grows. What are the new tax dollars accomplishing? How effective are the new curricula and the new technologies? Are our students learning as well as other students? Are we making the most effective use of our teaching and are we employing the most productive technologies? And lastly, how can the community participate in setting the goals and objectives that are desired, i.e., set the criteria for accountability?

The outcome of these inquiries has been to arouse a new interest in using and improving the methods of program evaluation, evidenced by the establishment of several university research units devoted to the study of such evaluative approaches and by the writing of requirements for assessment into the more recent federal educational legislation.

This was the nature of the ferment in education. It could be described as an early stage of educational revolution. As John Gardner, former Secretary of Health, Education, and Welfare (HEW), recently said:

> "We have already developed and tested many of the new ingredients of a new era in education. But the pieces of the educational revolution are lying around unassembled."[7]

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[7]Gardner, John W. Conversation with the staff of the Commission on Instructional Technology, July 1969. Quoted in *To Improve Learning*, A Report to the President and the Congress of the United States by the Commission on Instructional Technology, Washington, D. C., 1970, p. 38.

When these pieces are assembled, this assembly will undoubtedly be done in terms of a new technology and philosophy of education which reflects, responds, meets, and answers the fast changing needs of our society. The critical need to assemble and combine human resources and talents with technological advances and knowledge by using a systems approach to solving educational problems was much talked about within and outside Title VII during the 1960's. The need for such advances in the process and systematic approach to educational problems was described by the Commission on Instructional Technology in its 1969 report which indicated the necessity of finding-----

> "...a systematic way of designing, carrying out, and evaluating the total process of learning and teaching, in terms of specific objectives, and employing a combination of human and nonhuman resources to bring about more effective instruction."[8]

The objectives of the National Defense Education Act were formulated and set forth in an atmosphere of national emergency. Science and technology were to be rallied to increase the national security, and every American child able to absorb the new technology was to be offered the opportunity to be educated to his capacity. It was decided that throughout their school career each student's counseling for useful, nationally needed vocations was to be increased. Especially in science, mathematics, and modern languages, students were to have the advantages of the latest instructional resources. This is where Title VII came in: *"to mobilize the latest and most effective communication technologies in support of classroom learning."* (See Figure 1.)

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[8] *To Improve Learning*, pp. 5 and 38.

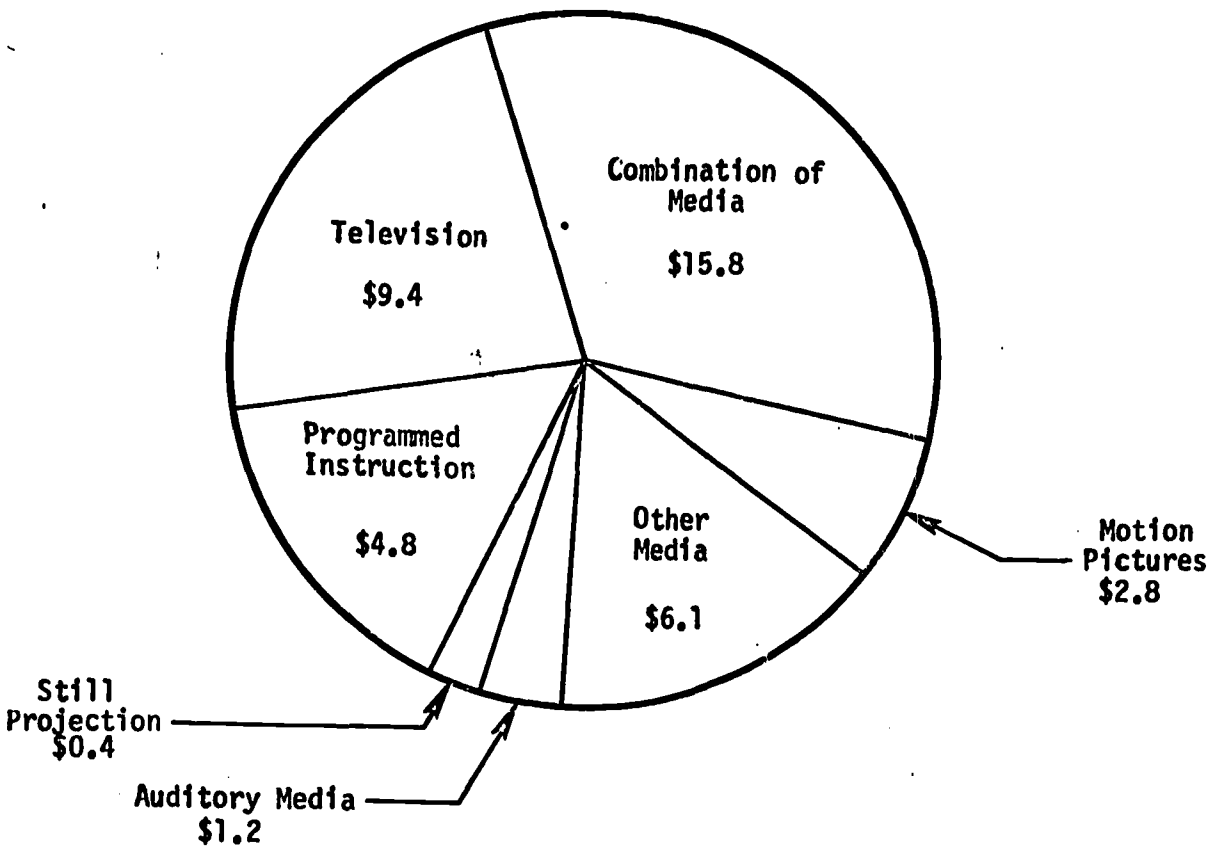



Fig. 1. Distribution of Title VII Expenditures by Instructional Medium

## WHAT WAS EXPECTED OF TITLE VII

When the National Defense Education Act was being considered between January 8 and April 3 of 1958, more than 90 citizens testified before the Elliott House Committee on Education. The shadow of Sputnik hung over their testimony. Dr. Werner von Braun called the education and training of scientists and engineers "a matter of national survival." Dr. Edward Teller said, "This we have to do, or our way of life will not survive." Introducing the bill in the Senate Education Committee, Senator Hill said, "The war of tomorrow will be won or prevented in the classrooms of today. That means in the grade school and high school, as well as university classrooms."

The objectives of the Act were formulated in this atmosphere of national emergency. Science and technology were to be rallied for the national security, and every American child able to absorb the new technology was to be offered the opportunity to be educated to his capacity. Counseling for vocations was to be increased. It was decided that throughout their school career, and especially in science, mathematics, and modern languages, all children should have the advantages of the latest instructional resources. This is where Title VII came in: it was intended to mobilize the latest and most effective communication technologies in support of classroom learning.

Both in the Senate and in the House, representatives of the educational establishment (among them, the American Council on Education, the National Education Association, universities, and school systems), labor (AFL-CIO), foundations, the National Academy of Science, related agencies of government, and manufacturers of audiovisual equipment spoke for Title VII. Charles H. Percy, now senior senator from Illinois but appearing then as president of Bell and Howell, said that "the tremendous increase in the body of learning makes it more than ever necessary for us to use effective aids in the learning process."

Maurice B. Mitchell, president of Encyclopedia Britannica Films, showed some instructional films to the Congressmen and said:

> "I suspect some day in the future when we reach the millenium we will have enough school buildings and teachers who will be adequately paid. We will not reach the millenium in effectiveness of learning

> and skill until we match those facilities with instructional materials that in their own way represent the most effective and modern devices we can provide to aid the teachers in the difficult process of communication in the classrooms."

He pointed out that good teachers in the key subjects were in short supply, and that even a good teacher could benefit from a "master laboratory assistant" on film.

Professor C. Ray Carpenter, of Pennsylvania State University, told the Senate Committee that

> "capabilities of the mass mediums of communication have been largely developed and applied in the U.S. for purposes other than education... their full employment can effectively solve some, but not all of the problems of our numerous and complex educational systems."

Dr. Detlev Bronk, president of the National Academy of Sciences, spoke positively of the use of media in the teaching of science, and his statements were most significant because the scientific community was especially influential in Congress at that time.

When the Education and Labor Committee reported the bill to the House with a "do pass" recommendation, it listed some of the objectives for Title VII which the Committee had distilled from testimony like the above mentioned. The recommendation said:

> "The program should result in an overall attack on the problem of utilizing mass mediums in the educational process. First of all, it will provide an evaluation of what has already been accomplished through the efforts of the numerous public and private agencies which have pioneered in this work. Second, it will identify the directions which seem most likely to prove fruitful in future study and experimentation. Third, and most important of all, it will produce scientific evidence through the efficacy of utilizing mass mediums in education for the use of those concerned with education--both professionally and as citizens--and for making plans for the further development of our educational system."

Title VII actually caused little debate--for example, only 60 of 2096 pages of total testimony before the House subcommittee were on that part of the Act. Floor discussion was predominantly favorable. Representative Thompson of Wyoming suggested that an expanded program of research through the National Science Foundation might well be considered, he emphasized that he was not negative toward the NDEA research program. Representative O'Hara of Illinois spoke of the success of early morning science education programs in Chicago and asked, "Mr. Chairman, if 40 professors in Chicago and a radio station can combine forces in a great experiment, and from this can come such results with one program, what may we not expect can come from a Title VII program, provided there is wise administration?" Representative Schwengel of Iowa suggested that "use of these media would stretch the current supply of teachers and permit fuller utilization of particularly gifted classroom teachers." In the Senate, Senator Smith of New Jersey predicted that "teaching effectiveness will be further aided by a federally sponsored program of research and experimentation in the use of television, radio, strip films, and other audiovisual techniques--a study which will encourage the states and local educational agencies to make better use of these mediums." Senator Allott of Colorado was very hopeful about the effect of Title VII. He said:

> "The present material available excited the imaginations of our committee members with the possibilities, in terms of more effective utilization of television, radio, motion pictures, and related mediums in the educational field. It seems entirely possible that real strides can be made within the next few years. The potentialities of these research programs are great in terms of increasing the interest of children in education, and consequently motivating them more strongly; and also in terms of minimizing the very expensive problem of reducing faculty-student ratios. At the same time, we literally can burst beyond the limited vista of the classroom. Via TV, we can extend the realm of teaching to the museums, the opera, stage, and research laboratories--all out-of-doors."

It is fair to say that a strong emphasis on utilization, a summing up of what had already been found out about new instructional technologies, identification of most promising avenues for further study, scientific evaluation of the effectiveness of educational media and materials--were all salient and uppermost in the minds of the legislators who dealt with Title VII.

As Title VII came out of the two Houses of Congress and the conference committee, it retained the emphasis on research that would be practically useful in improving teaching through the use of media and in "getting such knowledge" into circulation.

On September 2, 1958 Title VII came into effect with high hopes of what it could accomplish by mobilizing and channeling knowledge to make education more effective.

Title VII
National Defense Education Act

PROVISIONS
in brief

Part A authorized the Commissioner of Education, through grants or contracts, to "conduct, assist, and foster research and experimentation...including the development of new and more effective techniques and methods: (1) for utilizing and adapting motion pictures, printed and published materials, videotapes and other audio-visual aids, film strips, slides and other visual aids, recordings (including magnetic tapes) and other auditory aids, and radio or television scripts for such purposes; (2) for training teachers to utilize such media with maximum effectiveness; and (3) for presenting academic subject matter through such media."

Part B authorized the Commissioner to "disseminate information concerning new educational media, including the results of research and experimentation conducted under Part A to state or local educational agencies, for use in their public elementary or secondary schools, and to institutions of higher education" by entering into contracts for "(1) studies and surveys to determine the need for increased or improved utilization of (instructional media)....; (2) catalogs, reviews, bibliographies, abstracts, analyses of research and experimentation, and such other materials as are generally useful in the encouragement and more effective use of (instructional media)...."; (3) (upon request) providing "advice, counsel, technical assistance and demonstrations to state or local educational agencies and institutions of higher education undertaking to utilize such media."

The Advisory Committee was to consist of the Commissioner, as chairman, a representative of the National Science Foundation, and three persons from each of the following constituencies: (1) individuals identified with the sciences, liberal arts, or modern foreign languages in institutions of higher education; (2) individuals engaged in teaching or supervision of teaching in elementary or secondary schools; (3) individuals of demonstrated ability in the utilization or adaptation of (instructional media); and (4) individuals representative of the lay public who have demonstrated an interest in the problems of communication media. The Committee was to (1) advise, consult with, and make recommendations to the Commissioner on matters relating to the utilization and adaptation of (instructional media), and on matters of basic policy arising in the administration of Title VII; (2) review all applications for grants-in-aid under Part A, and certify approval to the Commissioner of any such projects which it believes are appropriate for carrying out the provisions of Title VII; (3) review all proposals by the Commissioner to enter into contracts under Title VII and certify approval of any such contracts which it believes are appropriate under Title VII.

Appropriations were authorized in the amount of $3 million for the first year and $5 million for each of the nine succeeding years.

## HOW TITLE VII WAS ADMINISTERED

The legislation did not provide for a permanent staff, although it did contain liberal provisions for employing consultants. The few permanent employees, whom the Office of Education was able to assign to the administration of Title VII, were therefore supplemented by specialists in the field of instructional media brought in from the universities on one and one-half year, or shorter appointments. Field readers were employed primarily for Part A projects, and were compensated as consultants. This made, on the one hand, for the infusion of fresh ideas and viewpoints; on the other, for frequent turnover of administrative personnel.

The relation of the Advisory Committee to Part A of Title VII was somewhat different from its relation to Part B. The committee reviewed all proposals for grants and contracts under Part A (the research program), and took formal action on them at its meetings. The Commissioner of Education was empowered to support *only* those projects specifically approved by the committee, but he retained the right to question some proposals which they approved. The committee exerted no such binding authority over Part B (dissemination) projects. Its advice was sought on Part B proposals, but support for them was not contingent upon the committee's approval. In practice, therefore, the Office of Education Title VII staff had greater leeway with the dissemination than with the research program.

Prior to the enactmant of NDEA, the office's capability in media had been limited to a radio script and film distribution group. These functions and personnel were absorbed into the Title VII activity. Once established, the Title VII function had a number of locations on the USOE tables of organization. In fact, in its later years, its functions were distributed across a number of bureaus.

### Funding Criteria

Five general criteria for support of projects under Title VII were developed and distributed to persons interested in submitting proposals. These were:

1. Relevance to Title VII program intent. The projects had to deal with "newer educational media"--those cited in the law plus any that appeared later, such as programmed instruction. The projects had to demonstrate potential for benefiting public schools or institutions of higher education. Proposals which dealt exclusively with the development of instructional materials were not considered eligible for support--except to the extent necessary to carry out research or to report or demonstrate the findings of research on the new materials. Thus, development of curricular materials *per se* was foreclosed and shut off from support. Similarly, projects dealing with the administrative use of educational media were ineligible. For example, the development of computers for programmed learning was supported, but their use for flexible scheduling apparently was not.

2. Significance of the project. Priority was given to work that promised to be of national significance and to contribute valuable new information.

3. Adequacy of procedures. The scientific quality of the proposed research was carefully evaluated. Research was expected to be so designed as to facilitate the generalizing of results beyond a local setting, to make replication possible in other settings, and to permit measuring of the results objectively and reliably.

4. Suitable personnel and facilities. Each proposal was expected to show that the project would be staffed adequately with persons competent in the curriculum area to be studied, in the educational and research methodology, in the use of the medium or media involved, and in other areas relevant to the project. It was also expected that necessary research equipment and materials would be shown to be available. Ordinarily, Title VII funds were not to be used for purchase of equipment, although in certain cases charging the project with 20 percent per year of the cost of essential equipment was regarded as acceptable.

5. Economic efficiency. Projects were to be evaluated in terms of their cost compared with the cost of alternative approaches to the same task.

As Part A proposals were developed they were sent to field readers for detailed comments and evaluation. In the later years of the Title VII program, these readers were brought to Washington, D. C., twice a year, to discuss the projects with the Office of Education staff. Abstracts of all proposed projects and complete copies of all the proposals recommended favorably by the field readers were sent to the Advisory Committee in advance of meetings with a recommendation by the office staff. On the first day of a committee meeting, all the proposals recommended by the readers and the staff, together with any additional projects that two or more committee members asked to have discussed, were set aside, reread, and individually rated by each committee member at the conclusion of the day's meeting. During the remaining days of the meeting, each proposal was discussed and formally acted upon. The committee could approve a project subject to negotiation between the Office of Education staff and the contractor of the proposal regarding desired changes in research design or budget. It could disapprove a project with or without comments.

The Title VII staff members within the Office of Education were required to provide an adequate and usable summary and evaluation of Part A proposals, and then to serve as negotiators and contract monitors for the projects that were to be funded. With Part B, the Title VII staff had greater leeway. It would initiate discussion of projects with prospective contractors, and it could fund projects on its own decision, subject to the restrictions of the Act and the procedures of the office. In many instances, external opinions were solicited regarding a proposal prior to a decision. A shift to pre-specified program priorities and areas occurred during the later years of Title VII.

## The Legislated Advisory Committee

The function and importance of the Advisory Committee changed somewhat as the position of Title VII was altered within the Office of Education. During the first four years, when the new program was getting under way and before the system of field readers, long-term consultants, and staff evaluations was fully built, the committee was

expected to review proposals and assist in establishing guidelines for the operation of Title VII. During this time, members of the committee--many of whom held strong opinions regarding the future of Title VII--reported that they often felt frustrated. This frustration seemed to have two main causes: first, discussion of technical details was carried on at the expense of policy discussions, and secondly, the USOE commissioners did not share the committee's optimism regarding the future of instructional media. In the beginning, however, committee members did feel a greater sense of being useful and being depended on, than in later years when other media oriented programs gradually "absorbed" Title VII.

Between 1962 and 1965, the Office of Education was given vastly increased responsibilities for administering federal funds and programs, and was in a perpetual state of reorganization to meet these new obligations. This was a period of uncertainty both for the office staff and for the committee. The reorganization of 1965 diffused the Title VII projects throughout the office and left the committee with somewhat less than a clear mandate. For the last three years of Title VII's existence, the resources of the Advisory Committee were called upon more often for policy recommendations than for help with the details of administration. Thus, members were able to realize the committee's most useful function--policy advice--only toward the end.

## The Study Section

As the Office of Education gained experience with Title VII, it added a new administrative element: an Educational Media Study Section. This was made up of scholars from various disciplines who had been active in the study of instructional media. The initial purpose of this group was to furnish guidance in the selection of priority areas for research, thus providing a sense of direction rather than diffusing research under Title VII. This group met rather infrequently, but exerted considerable influence on the program. This influence predominated because some of its members were also members of the committee, and also it could offer advice directly to the staff. It commissioned several papers that summed up research in various important areas and pointed toward urgently needed additional research.

Toward the end of Title VII, the Study Section and the Advisory Committee together submitted to the Commissioner a set of far-reaching recommendations for the development

of instructional media research. One of these was for a major review of the state of the art in instructional media supplementary to the report of the Carnegie Commission on Educational Television. Provision was made for carrying out this study under the Public Broadcasting Act. The recommended review was one of the last projects financed under Title VII, and was completed in late 1969 by a distinguished commission--the Commission on Instructional Technology.

## HOW THE MONEY WAS SPENT

The $40.3 million expended under Title VII was divided almost evenly between Part A (research) and Part B (dissemination). The ratio was approximately 48 percent to 52 percent in favor of Part B (see Figure 2). Certain large dissemination grants were made toward the end of Title VII which affected the final ratio (for example, over $1 million went to the instructional television libraries, and $1 million to help develop the children's television program "Sesame Street," a project designed to provide preschool instruction primarily to culturally disadvantaged youngsters). From 1958 through 1962, the major expenditures were on Part A. When the research results began to be reported in 1963, the weight of spending shifted to Part B since there was now more knowledge, techniques, etc., to disseminate (see Figure 2).

The amount of money provided for Title VII bought more than 600 projects that were funded through grants and contracts. It is necessary to state the number approximately because the records were not in every case complete, and sometimes it was uncertain whether a recorded grant was for continuation of a project or for a new project.

As the next chart illustrates (Figure 3), about half of the projects were field or laboratory research efforts (surveys, experiments, field tests, and case studies), and another very large group was for development, planning, and design studies. Fifty-seven conferences and workshops were also financed under the Title.

Where were the studies conducted? Overwhelmingly in colleges and universities, as Figure 4 shows.

Although most of the studies were done at universities, as subject matter the studies concentrated on elementary and secondary, rather than on higher education. This is illustrated in Figure 5.

How were the studies distributed among the instructional media? Significantly, the largest block of money was allocated for *combinations* of media--a step toward the systems approach to use of learning resources--which appeared as one of the novel and important points of emphasis resulting from the educational ferment of the 1960's (see Figure 6). Among individual media, the largest amounts went to instructional television which was moving into the schools during the life

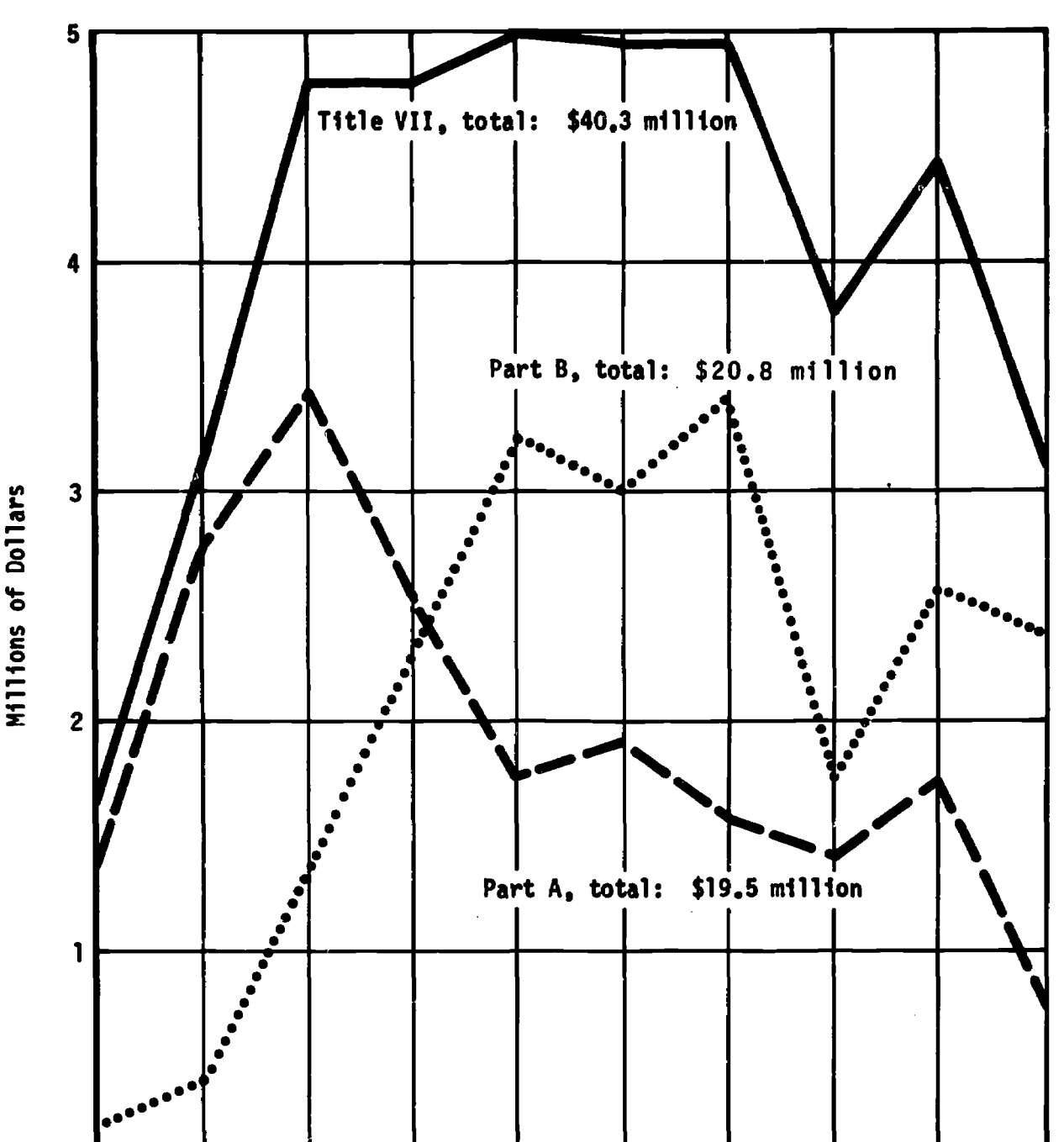



Fig. 2. Expenditures on Title VII, Parts A (– – –) and B (.....), for the ten years 1958 to 1968.

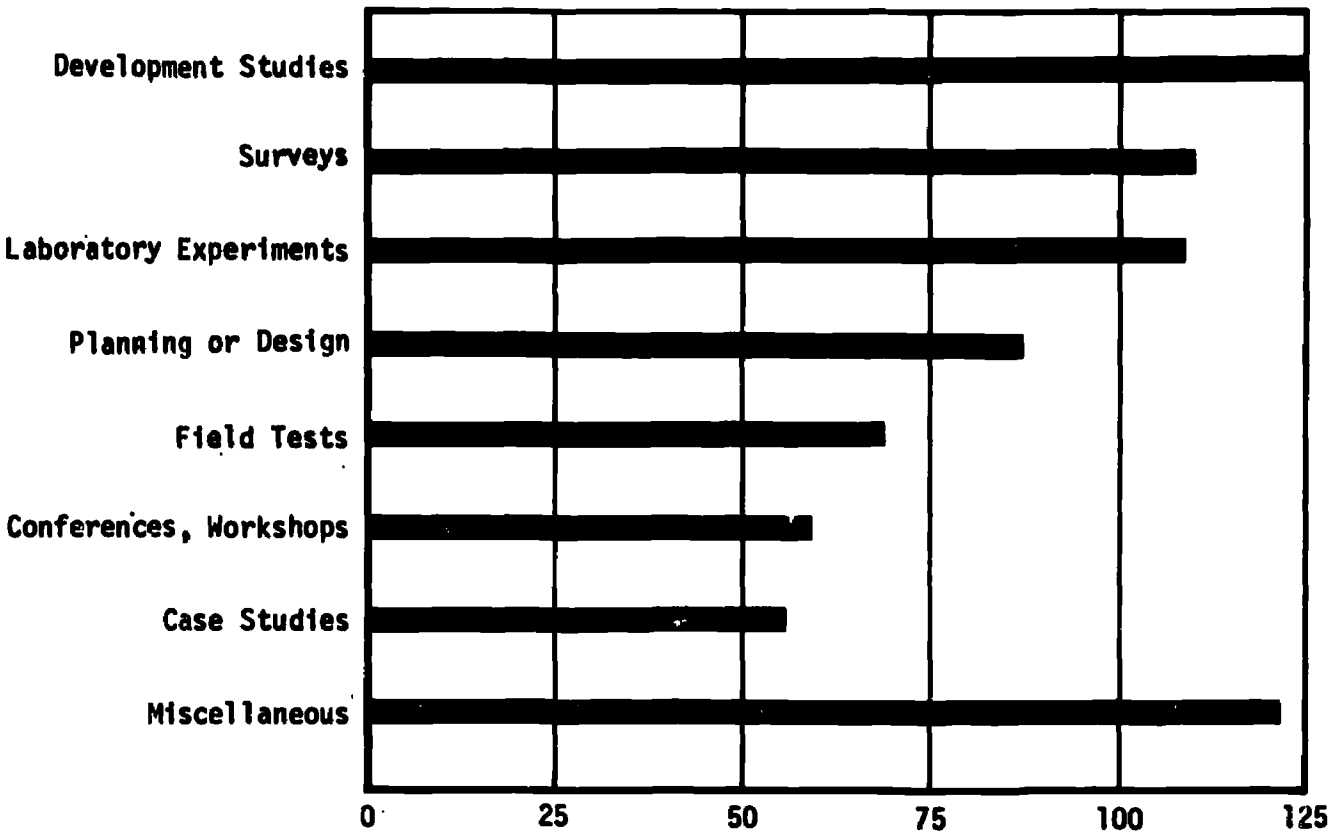



Fig. 3. Distribution of Title VII Projects by Types

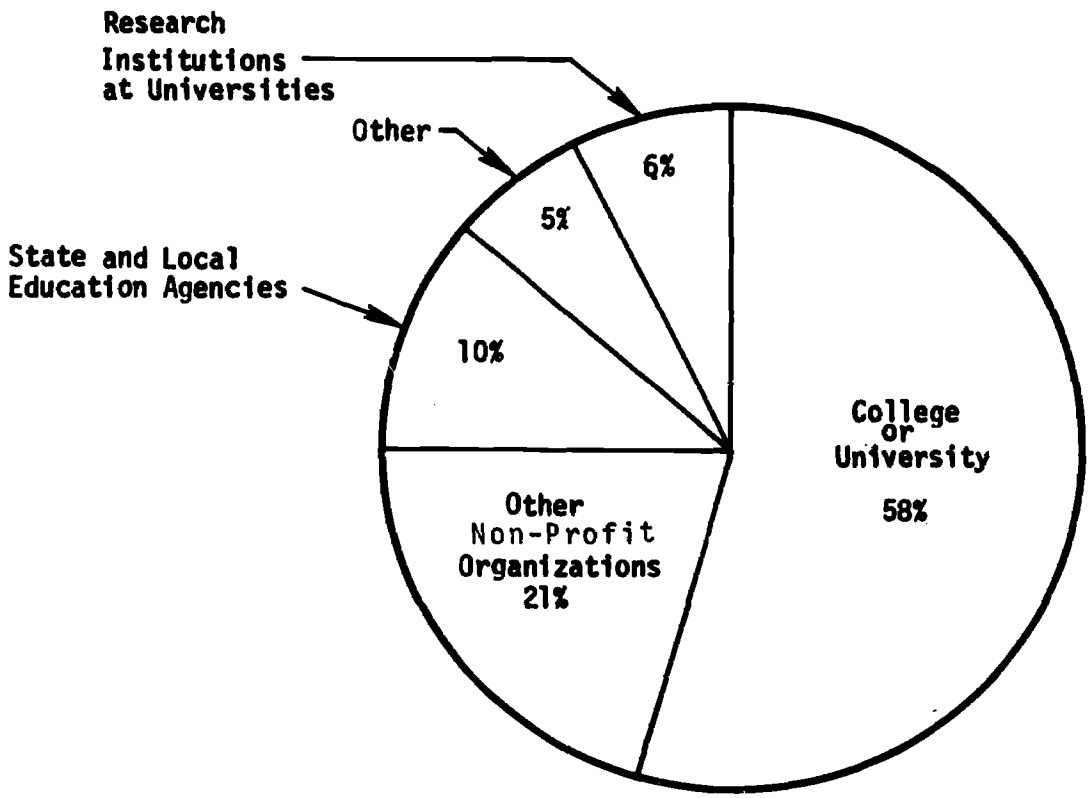



Fig. 4. Distribution of Title VII Projects by Type of Organization

of Title VII, and to programmed instruction, which was the "new" technology of that period. Instructional films, which had come into use several decades earlier and had been studied extensively in the late 40's and 50's, were in third place.

Another way to look at the distribution of funds and grants under Title VII is in terms of the kinds of topics that were investigated. As Figure 6 demonstrates, the projects were overwhelmingly concentrated on instructional systems and practices, which is what the framers of the Act must have intended. A relatively small proportion of the projects was dedicated to more basic research in the learning process. It is interesting to note (see Figure 6) that considerable emphasis was placed on independent learning systems and self-directed study, which were central to one of the chief currents of the prevalent educational ferment--individualized instruction; and also that computer-assisted and computer-managed instruction, both of which were just beginning to emerge at that time, received a considerable amount of support.

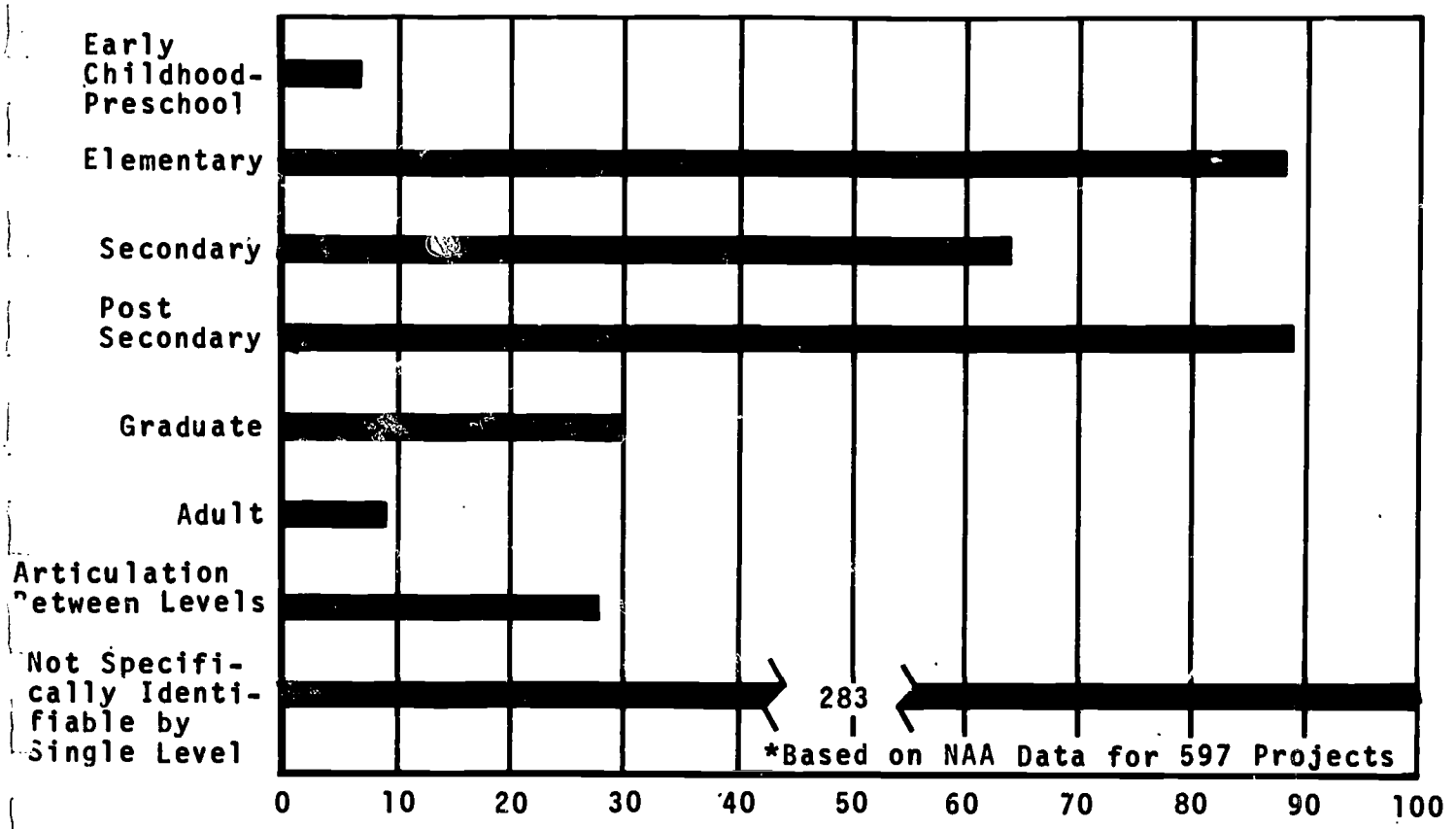



Fig. 5. Title VII Projects by Education Level of Target Groups

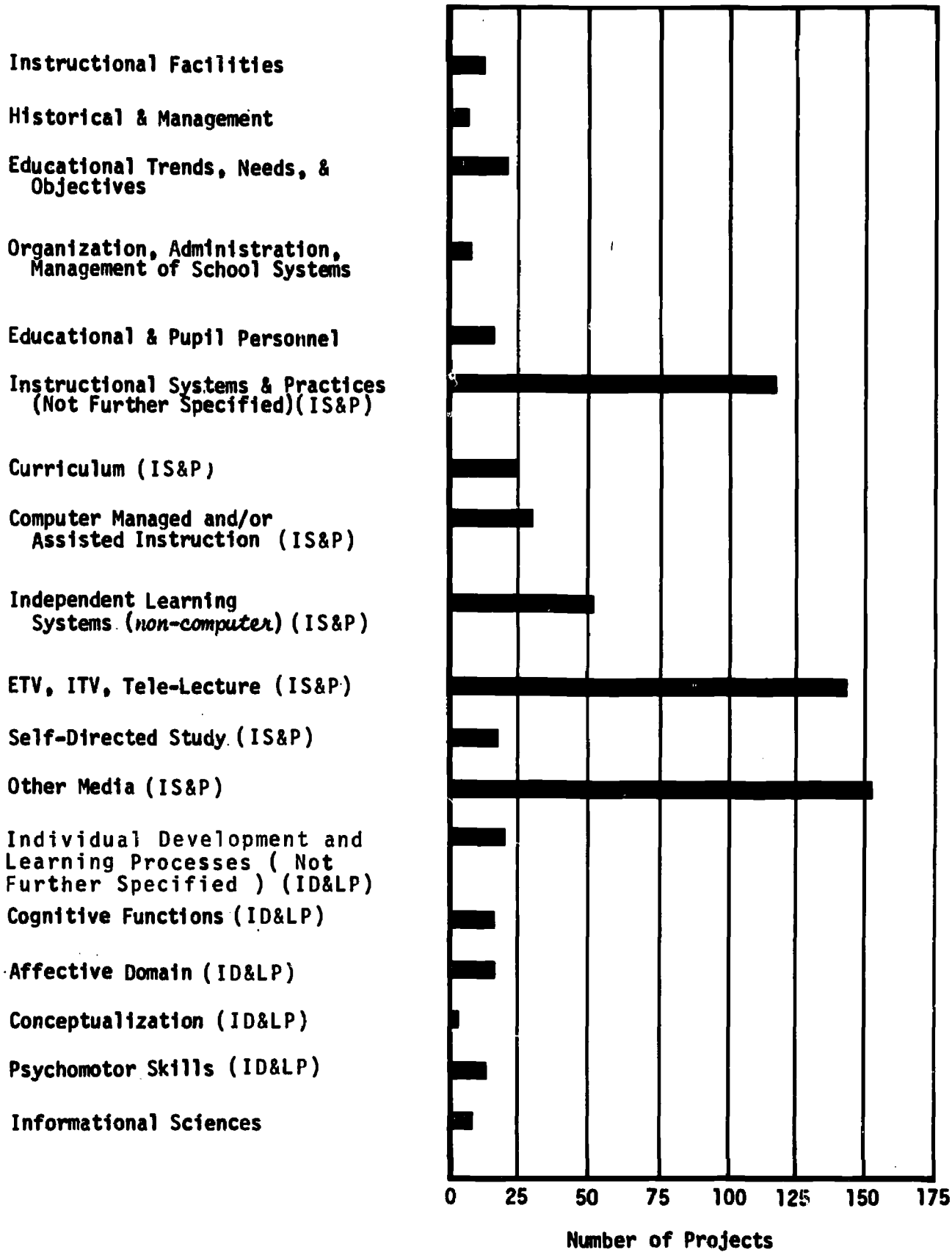



Fig. 6. Approximate Proportions of Title VII Projects by Topics

Examining the impact of modern technology on instruction in 1969 is like examining the impact of the automobile on American life in 1908 when the Model T first came on the market, or the impact of technology on farming a decade after the appearance of McCormick's reaper. Western man may now be entering the post-industrial age, but his children attend schools and colleges that are just catching up with the industrial age, and have scarcely been brushed by the communications revolution. Indeed the very term "instructional technology" is unfamiliar not only to the public at large but to many teachers and administrators as well.

Report of Commission on Instructional Technology, 1969

## THE PART TITLE VII PLAYED IN THE EBB AND FLOW OF EDUCATION

### In General

Before saying anything about the impact of $40.3 million, it will be useful to put that amount of federal funding, as well as the idea of educational impact, into some perspective.

By any standard of financial support for education, the expenditure on Title VII was not very large. For instance, federal expenditures for education during its life ranged from one half billion to over five billion dollars. It was for example, about one percent of the sum recommended in 1969 by the recent Commission on Instructional Technology for the operating expenses of a national research institute in this field ($415 million per year). Cooperative research was spending about $10 million a year during the period when Title VII was spending an average of $4 million. At that same time Title III of the NDEA was pumping about $75 million a year into state educational agencies. At the beginning of the 1960's. private foundations were spending about $200 million a year on education, and eight foundations alone--Ford, Carnegie, Rockefeller, Sloan, Kettering, Danforth, Esso, and Kellogg--were putting about four times the Title VII amount into current studies and development of instructional media. The great bulk of foundation spending on the instructional media went to instructional television. Title VII actually supplied more for research with films and programmed instruction than did these foundations. But, nevertheless, it is clear that Title VII's expenditures were small in comparison to private support in this field. They were a very small part of the Office of Education's total support of instructional teaching materials (which are estimated conservatively at $500 million between 1958 and 1968),[9] and the ten-year total appropriation under Title VII portion of NDEA. The intention of encouraging a fundamental development in American education was never more than a tiny fraction of one percent of the national expenditures on education.

We must also note that it is not easy to assess the impact of a complex research activity like Title VII. When a major goal of research is to develop products for use--as, for example, a polio or rubella serum, an earth satellite, or a nuclear bomb--the results can be readily seen, even though the assessment of the usefulness of the product may have to wait a generation or more. When the goal is not a physical product, however--when the objective is ideas that may contribute to scholarly knowledge and ultimately enter into the teaching

[9] Estimated Obligations for Instructional Materials (Developed from USOE Reports).

done in thousands of schools by millions of teachers--then it is indeed difficult to measure what the impact has been over any short period. Many scholars have been "discovered" after death; many scholarly ideas have had to wait years for recognition; many innovations have taken decades to diffuse through the schools, as noted by Paul Mort. The first considerable work on programmed instruction in the United States was done by Professor Sidney Pressey, of Ohio State University in the 1920's; however, it lay fallow until a historic paper by Professor B. F. Skinner of Harvard gave new life to this idea in 1954, and led to broad use of the new method and ultimately to the development of computer-assisted instruction. Therefore, the immediate impact of Title VII may be only the tip of the iceberg of total impact, and we may be incompletely evaluating even the impact that is readily visible.

Furthermore, in a field like education, it is not always possible to separate the effects of one project or one source of funds from the effect of others. Title VII made a contribution to programmed and computer-assisted instruction, but so also did Carnegie, Ford, the Fund for Advancement of Education, a number of private manufacturers and development organizations, and other parts of the federal government.

Title VII put $1 million into the development of "Sesame Street," but other organizations put in another $7 million. Title VII funded the basic studies for the Educational Research Information Center (ERIC), but the whole field of information science was developing at the same time (largely with the aid of other sources of funding), and ERIC was merely one outgrowth of the larger movement. For any educational change it is impossible to identify a single basic cause of the change or even to know the essential contribution of any single factor. There are multiple sources of ideas, funds, and a complex process of research, development, trial, and application.

Our belief is that the chief impact of Title VII is likely to be a "delayed fuse" effect and will be reflected in and combined with later developments in the field of instructional technology--many of which it has helped to stimulate. Examining the relationship of Title VII to the main currents of the educational ferment of its time is, perhaps, the best guide to determining the hidden effect of the program. This we shall try to do, but first let us look at some of the immediate evidences of impact.

What kind of impact did Title VII make on the scholarship of its time?

The amount of scholarship in educational technology increased markedly during the life of Title VII. One evidence of this is the increase in quality and size of the chief scholarly journal in the field, the Audio-Visual Communication Research (AVCR). Between 1960 and 1969, 23 percent of all the articles in this journal were related to direct outgrowths of Title VII projects.[10] The contribution was especially high in the years 1963 through 1966, reflecting Title VII's high investment in research during the several years before 1965. In addition to Title VII articles, the journal published 293 research abstracts of Title VII reports that appeared in 15 supplements between 1961 and 1967 when the work of abstracting was taken over by the new ERIC clearinghouse. AV Communication Review also published two complete special supplements prepared under Title VII grants by the Educational Technology Project of the University of Southern California and the Department of Audio-visual Instruction of the NEA. One of these was "The Changing Role of the Audiovisual Process in Education: A Definition and a Glossary of the Related Terms." Therefore, it is clear that Title VII had a major impact on a principal journal in its field.

In three of the chief periodicals for practitioners of educational technology--Audiovisual Instruction, Educational Screen, and Educational Technology--almost no articles between 1960 and 1969 acknowledged Title VII as their source. This is not entirely surprising because Title VII research was not geared to producing articles at the practical level of these journals and seldom do the authors of these articles acknowledge sources of funding. On the other hand, the list of authors who wrote for these journals during the 60's reads like a glossary of Title VII research directors. It is reasonable to suppose, therefore, that although Title VII did not contribute directly to these journals, it must have had a considerable indirect influence.

A sampling of three educational research journals not focused on instructional media--the American Educational Research Journal, the Journal of Educational Research, and the Journal of Educational Psychology--showed that 3 to 16 percent of the

[10]The sample began with 1960 issues, rather than with the beginning of Title VII in 1958, because given the necessary time for research and the usual publication lag, it would be extremely doubtful that an article from a Title VII project could be published before 1960.

articles in the different journals acknowledged Office of Education support, but only 1 to 5 percent acknowledged support from Title VII. The percentages bear some relationship to monies expended for Title VII as contrasted to all Office of Education support in the general area of media.

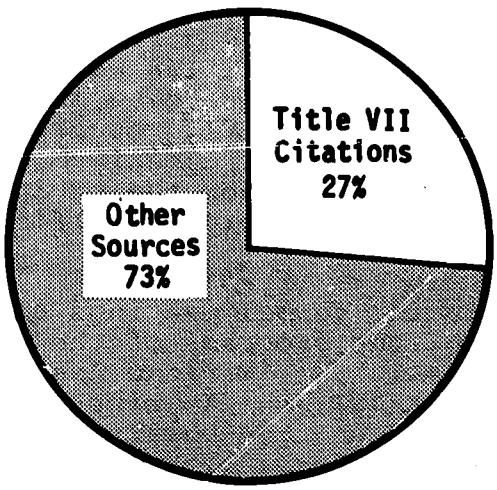
Another way to look at the visibility of research is to examine the publications cited by authors in their research articles. An 18-month sample (in 1968 and 1969) of journals that might have been expected to carry some reports of research in instructional technology, showed that of the 33 research articles cited most frequently by writers in those publications, only one acknowledged support from Title VII. When the sample was limited to references to articles about instructional media that had appeared since 1960, then Title VII was found to be the origin of 23 percent of the media articles cited three or more times.

An excellent measure of the impact of Title VII on the field of media scholarship can be derived from critical reviews and summaries of the field, in which leading scholars single out the scholarship which they feel is worth reviewing or summarizing. Four such reviews, compiled between 1962 and 1968 were examined:

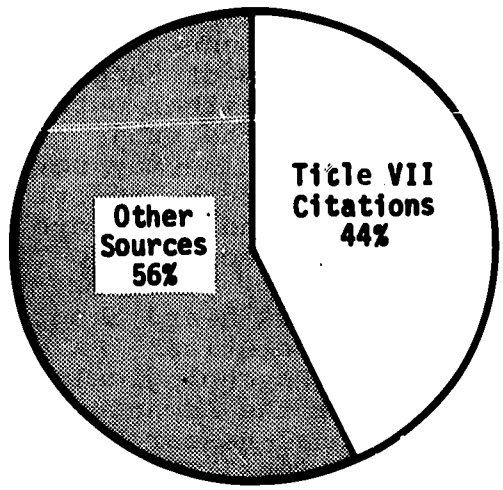
- Two issues of the Review of Educational Research, in 1962 and 1968, devoted entirely to instructional media research.
- A monograph, Research in Instructional Television and Film, by J. C. Reid and D. W. MacLennan, completed in 1965 but published in book form in 1967.
- A review chapter in the Annual Review of Psychology for 1965, entitled "Mass Communication and Educational Media," by A. A. Lumsdaine and M. A. May.

(For a breakdown, see Figure 7).

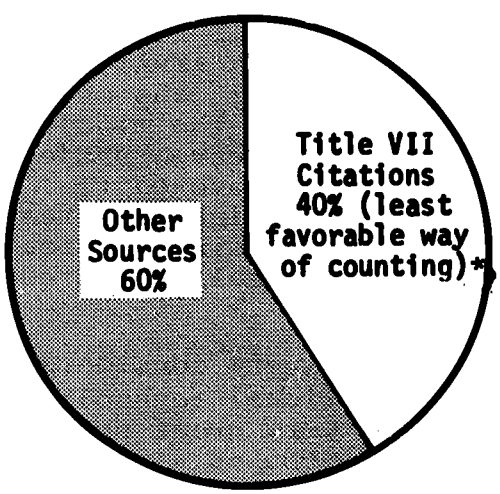
It would be expected that the proportion of Title VII citations in the above would be somewhat higher than in the case of learned journals because these reviews would not be limited to printed materials. They would also include monographs and reports circulated in advance of publication. Even allowing for this, however, the results leave no doubt of how leading scholars in the field felt about the importance of Title VII research. In the 1962 Review of Educational Research, when Title VII had not been long in existence, 27 percent of all the references were to Title VII research; in the 1968



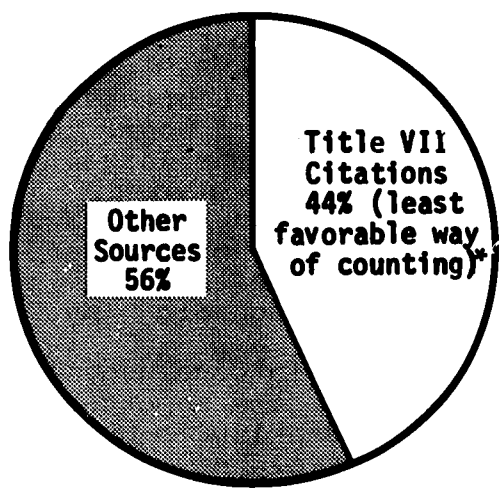

Review of Educational Research,
April, 1962




Review of Educational Research,
April, 1968




Research in Instructional Television
and Film, by Reid and MacLennan,
1965




Chapter on "Mass Communication and
Educational Media," by Lumsdaine
and May, in Annual Review of
Psychology, 1965

Fig. 7.

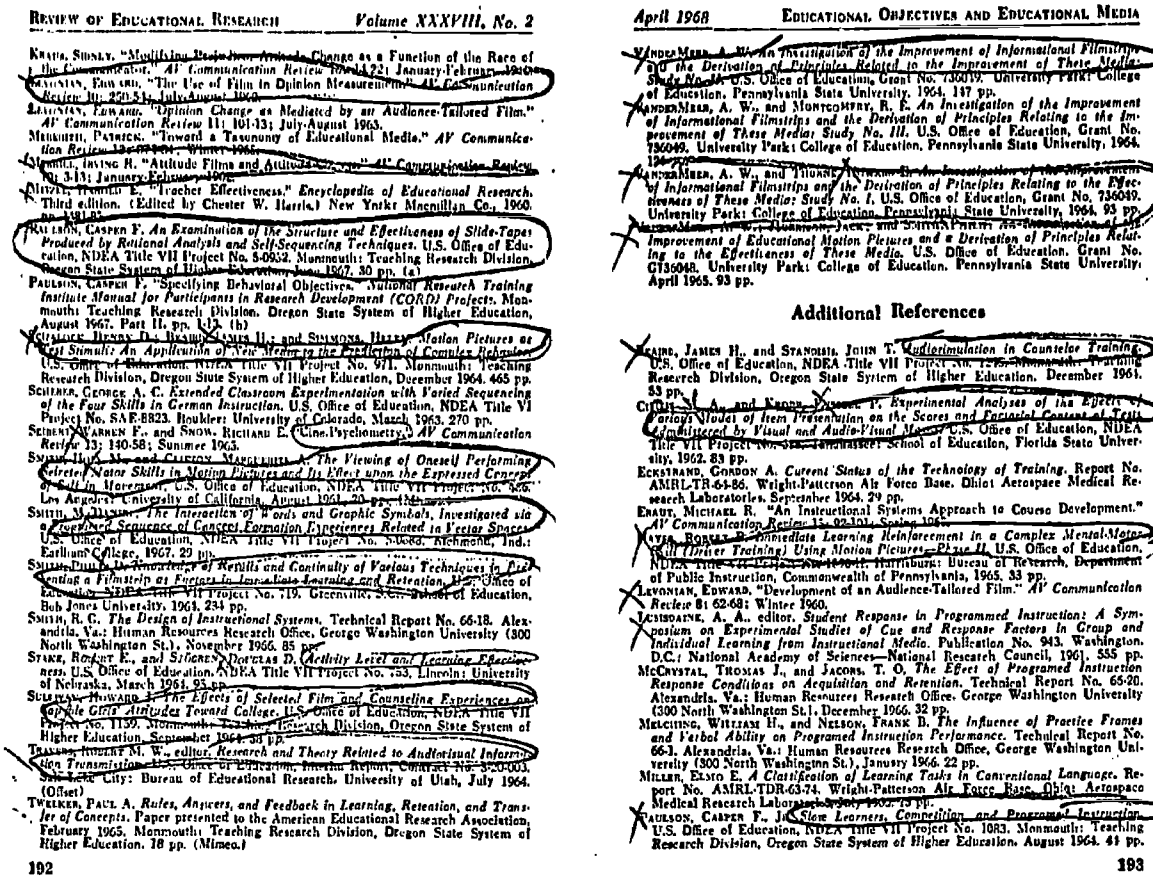
Proportion of Title VII Research Reports Among Papers And Books Worth reviewing in Reviews of Research on Instructional Media And Technology

*Includes only those where citation and project title identical.*

Review of Educational Research, when Title VII was nearly ten years old, this had increased to 44 percent. In the Reid and MacLennan review volume, a minimum of 40 percent and a maximum of 53 percent (depending on what titles were excluded as either outside the specified limits or else irrelevant to the subject) were examples of Title VII research. In the Lumsdaine-May review, a minimum of 44, or a maximum of 49 percent of the report (depending, again, on how the exclusions were handled), were the results of both topical and financial connections to Title VII research.

How much was heard about Title VII in the formal meetings of learned societies? An examiniation of the programs of the American Psychological Association (APA), the American Association for the Advancement of Science (AAAS), the American Educational Research Association (AERA), and the Department of Audiovisual Instruction (DAVI), showed that, with the exception of DAVI (which is centrally concerned with instructional media), the proportion of convention sessions devoted to instructional media was very small--2.5 percent for APA, 3.6 percent for AAAS and AERA. The number of Title VII project directors among speakers at the conventions ranged from one percent for AAAS to seven percent for DAVI. The percentage of papers directly acknowledging support from Title VII was miniscule. It must be remembered, however, that relatively few papers acknowledged their sources. A comparison of titles demonstrates that during these years at least 52 papers definitely reporting Title VII research were heard at DAVI conventions; 36 at APA; 26 at AERA; and 9 at AAAS. The peak of Title VII's visibility at the meetings of the learned societies came most typically in the middle 1960's when the largest number of Title VII research projects were being completed. The number of sessions devoted to media at both AAAS and AERA meetings was significantly greater after 1966, however, and this may well be an indirect effect of the increased visibility given to problems related to educational technology by Title VII.

Thus, it is concluded that Title VII made a very considerable impact on the reported research on instructional technology during the 1960's but did not amount to a very great share of the field of published educational research as a whole.



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Additional References

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Fig. 8. Density of Title VII citations on one page of the April, 1968 issue of the *Review of Educational Research* (circled = direct link, X = indirect link).

What did Title VII contribute to bringing researchers into the study of instructional media and technology?

More research is going on now in instructional technology than in 1958, and more researchers are so engaged. The availability of research funds under Title VII, and the new surge of interest that resulted were largely responsible for this development. This is generally agreed upon by researchers and educators. Yet it is difficult to find figures that clearly relate Title VII to the increase in instructional media research personnel.

There are no records, for example, as to how many graduate students earned their degrees with the aid of research assistance or grants provided by Title VII, although it is clear

that many of them did from the listing of their names as Title VII project members.

Interviews with 224 former Title VII project directors showed that approximately 60 percent of them began to do research on instructional media during the life of Title VII (43 percent came into the field since 1962). For a little over half of them (53 percent), their Title VII project was their first experience with federally-funded research. Only 10 percent of them reported that media research was their activity before they worked on Title VII. Many of them came into this discipline to stay; 31 percent (as compared with 10 percent before their involvement with Title VII) report that they now consider instructional media and technology their principal research field.

It seems beyond doubt, therefore, that Title VII did help bring more research talent into the study of instructional technology, and that many of them came from fields other than education. To name only a few examples: Professor B. Fred Skinner, the distinguished student of human learning, whom we have already mentioned; Professor Robert Gagne, a psychologist who studied thinking and problem solving at Princeton and became deeply involved in Title VII activities; and Professor Harvey White, the physicist from the University of California, who became actively concerned with instructional technology after his experience with media recording a television program and after completing a Title VII project. All gravitated more or less permanently to educational research after their initial contacts with this new discipline.

The Institute for Communication Research at Stanford, which had been a leader in multidisciplinary study of human communication, developed instructional media and technology as one of its main fields after some Title VII projects. Now it operates an ERIC Clearinghouse and conducts instructional media research on several continents.

Although his enthusiastic followers may not be aware of it, Herbert Marshall McLuhan completed a study for Title VII, in 1960, entitled "Understanding Media." It was intended to produce a series of materials which would teach school children in a new and interesting way. The report has never been published, but it contains many of the roots of his later, widely read book bearing the same name as the project.

Did Title VII contribute to the quality of research in its field?

This is very difficult to document--qualitatively for one thing, because journals and publishers referee the manuscripts submitted to them and maintain at least a minimum standard of methodological quality. Most observers think that it did. A more real test would be an examination of the research papers on instructional media that were *rejected* during the years of Title VII for methodological reasons, (or returned for revisions and substantial improvements in design). However, these archival materials are not available. A sample of 80 Title VII reports, spread over the period of 1958 to 1968, was examined and trends toward the better were observed, for instance, an improvement in sampling methods. If one can make a claim for the influence of Title VII on methodology, it must rest on the conclusions of observers that the Title VII staff and committee, insisting from the first on high standards of research techniques, did hold up a high standard for the field and especially for young researchers entering it. It is also evident that many of the researchers now working on instructional evaluation and computer-assisted instruction have come to their current tasks from some initial experience in Title VII projects. This is also reflected in the occupations of Title VII project directors as listed in this study.

Although there are no definite figures on the number of young researchers trained under Title VII, new Departments of Educational and Instructional Technology emerged in several schools, i.e., University of Southern California, Indiana, etc., for the main purpose of training instructional media researchers and practitioners. Title VII was instrumental in building these departments.

What part did Title VII play in developing institutions in the media field?

When one counts the number of publications directly resulting from Title VII research, one is dealing largely with immediate impact. On the other hand, when one considers the impact of bringing new researchers into the field, or the training of young people to become competent researchers, one is dealing with a delayed effect--the full impact of which will not be felt for a number of years. This is true to an even greater extent of Title VII's contributions to the development of institutions, for these will be contributing to the improvement of

instructional technology for many years after the demise of the originating legislation.

One of the most readily visible results of Title VII is a set of institutions for training, research, and service in the field of instructional media and technology. In this group, are several university departments considered to be among the foremost in training and research in the profession. Some of the departments where substantial amounts of Title VII activity went on were scrutinized, and reports have been obtained on what Title VII contributed to their development.

For example, at *Pennsylvania State University* there were 21 Title VII projects, totaling over $1 million in grants. Penn State professors and administrators reported that one Title VII project became a prototype for the adoption and use of low-cost helical scan videotape recorders on 16 of the university's branch campuses throughout the state. Now nearly 2,000 videotapes are being exchanged among campuses. This particular project was carried on at a cost to the federal government of less than $10,000 and it now continues entirely with university funds. Computer-assisted instruction was also initiated at the School of Education at Penn State via Title VII funding. Since that time, there have been at least 12 other projects at Penn State concerning the use of the computer for educational purposes. Still another project was concerned with improving teaching materials for the School Mathematics Study Group (SMSG). These materials were published, and the five-year sales totals amounted to more than 250,000 copies. The material has already appeared in Spanish and will be soon translated into Portuguese. A number of doctoral candidates worked on these and other projects and were supported by research assistantships. Many of them have made instructional technology their principal research field.

At the *University of Southern California* some 20 Title VII projects totaling $1.14 million were under study. These included the writing of a large, influential review of educational technology, and an almost equally influential study of the instructional technology activities of state departments of education. Both problems were conducted under the direction of Dr. James Finn and his associates.

During the period from 1958 to 1968, enrollment in the USC Department of Instructional Technology has increased from 285 to 992. More significantly, the pattern of enrollment has changed. A course dealing with research in instructional technology grew from an enrollment of 3 in 1958 to a high of 140 in 1966. Enrollment has tended to shift from the more general courses, such as "Classroom Use of Instructional Media," to the more specific courses such as "Direction of Educational Materials Centers," "Evaluation of Instructional Media," "Programmed Instruction," "Educational Uses of TV," and "Instructional Systems." These changes are related directly, of course, to the kinds of advances with which Title VII was most concerned. Whereas no one knows what growth and changes would have occurred at USC without Title VII, the presence of a large amount of stimulating Title VII research along with the involvement of competent research assistants and creative field studies played a fundamental part in what happened to the department. The graduates during Title VII's lifetime have dispersed to 14 states and one foreign country. The majority are involved in higher education, the second largest group in public, elementary, and secondary school activities and the third largest in non-profit research and development efforts such as regional laboratories, etc.

During the 1958-1968 period, the Instructional Technology Department at USC did make important changes and grew significantly. Title VII activities and monies were present during this time. Therefore, the Title VII efforts contributed to the growth. The presence of Dr.J. Finn, Dr.W. Allen other Title VII directors, along with their supporting staffs, carried over into the course development and teaching assignments, although by no means providing the major support for teaching faculty positions. As an example, in the fall of 1969, 11 instructors with supporting teaching assistants were required to provide the courses available, while only six permanent professors were officially assigned to the department. In short, the balance of the teaching personnel are drawn from "nearby" sources and projects to complete the requirements. This had undoubtedly been the pattern throughout the Title VII period. It would be reasonable to assume that Title VII projects helped make people and resources more readily available to a developing Department of Instructional Technology.

At *Syracuse University* approximately $176,000 were contracted in Title VII funds. The present Syracuse Department of Education members believe that Title VII projects aided greatly in giving educational research stature as a truly professional occupation on their campus--both by enhancing the status of the Department and by providing research work to help graduate students complete their study. After Title VII projects had been concluded, the Education Department at Syracuse moved into related work. First, under the Elementary and Secondary Education Act, and later still, under the Media Institute Provisions of Title IX, NDEA.

During the period 1958-1968, over 25 projects were supported at *Indiana University* under Title VII, with funding totaling almost $2 million.

The current Division of Instructional Systems Technology, where the majority of the Title VII projects were conducted, grew from an Audio-Visual Center in the School of Education in 1940 to a Department of Audio-Visual Education in 1950 to a Division of Educational Media in 1959.

Of the 118 doctoral degrees awarded between the years 1959-1969, eight were completed with funding from Title VII's small grant program and the faculty reported that another 48, in terms of subject, time, and support were developed either directly or indirectly out of Title VII projects.

Title VII legislation provided the foundation and experience upon which other later acts, etc., would build. Consequently, it is not surprising to see that Title VII made a significant contribution to this institution in providing an opportunity to build a knowledge base necessary for reorganizing and restructuring the professional education program. Initial support from the NDEA, Elementary and Secondary Act, the Higher Education Act, and the Education Professions Development Act, helped to provide the necessary academic and professional staff, support staff, materials, and equipment which enabled Indiana University's integrated Audio-Visual Center's Instructional Systems Technology Program to make substantial progress during the period 1958-1969. The Divison of Instructional Systems Technology now serves 181 majors as contrasted to 59 in 1958 and has increased its professional-level faculty in this area from 8 out of 40 in 1958-59 to 23 out of 51 in 1969-70.

The *Michigan State University* (MSU) Instructional Media Center carried on a number of Title VII NDEA projects during the period from 1960 through approximately 1967, totaling approximately $1,620,055 in funding. The first of these was a contract to study the feasibility of developing an organization of groups with a primary interest in the field of educational media. This was also the first of a series of contracts which led to the development of the Educational Media Council. (The EMC continues to the present time with headquarters in Washington, D. C., and a membership from 18 national organizations.)

A second major contract was undertaken by Michigan State University's IMC in 1962 entitled "A Procedural and Cost Analysis Study of Media in Instructional Systems Development." The study was extended in 1964 and completed in 1966. During the latter two years of the project, a model developed during the first phase was tested out at MSU, Syracuse University, the University of Colorado, and San Francisco State College. Each of the institutions adapted the model to their own particular conditions and needs. Generally, the model proved to be effective and is currently used in modified form in numerous institutions of higher education across the country.

The first MSU doctorate in the professional program in Instructional Technology was presented in 1960. The next two doctorates were completed in 1963 and five more in 1965. From 1966 through 1969, there were 15 degrees in Instructional Development and Technology earned at MSU. Presently there are 133 majors enrolled in Instructional Development and Technology as compared with 111 a year ago, including 70 master's candidates, 3 specialists, 57 doctoral candidates, and 3 post-doctoral fellows.

During the years of Title VII, an impressive research organization, titled the *Teaching Research Group*, came into being within the *Oregon System of Higher Education*. It grew from a staff of three in 1960 to more than a hundred in 1969, and now carries on a large and significant program of research on the technology of instruction. Between 1959 and 1969

this organization completed $948,599 worth of research under Title VII. The effect of Title VII can perhaps best be expressed in the words of the present head of the Teaching Research Group, Dr. James H. Beaird, presented in a personal communication:

> The history of this division can be traced directly to a Title VII grant made to Dr. Jack Edling in May of 1959. The first five grants made it possible to operate, and further permitted the attraction of staff members who have been instrumental in the development of this organization.
>
> In the first three of four years of the division's existence almost all proposals prepared within the division were submitted to Title VII... Personnel within this division were strongly committed to the use of media and their potential for instruction.
>
> Teaching Research as an organization has grown and evolved largely as a result of the impetus and continued support given by that program.
>
> In terms of specifics, the activities of the Simulation Systems and Individualized Instruction Programs at Teaching Research are almost entirely traceable to Title VII activities. Additionally, the Director of the Learning Ecologies Program, the Director of the Evaluation Research Program, and the Division Associate Director all joined the staff as the direct result of the presence of Title VII projects. Our program of research, evaluation, and developmental training has been heavily influenced by knowledge and competency developed by many of our staff in association with Title VII projects.

It may be that Title VII's contribution to the growth of an academic institution may nowhere have been greater than in the case of the Oregon Teaching Research Center Group. Yet it must be stressed that these are only a few of the universities and organizations in which substantial amounts of Title VII activity took place. Wherever this happened, there was an intellectual focus on the improvement of instructional technology, an attraction for competent researchers to come into the field, and financial support for graduate students to learn to work in the field. These influences will be felt for many years. While the

foregoing statements indicate the growth of local campus facilities, and could be challenged as putting federal funds to local use for a priviledged few, these departments and research centers are *national* institutions in a real sense. The people and products and ideas quickly pass beyond their limits to other places across the nation. This is in no sense general aid to local business.

Did Title VII play any part in developing quality television programs for wide-scale dissemination?

Title VII was largely responsible for the continuing existence and circulation of high quality instructional television programs. Among the facilities and projects it supported are:

*The National Instructional Television Center (NITC).* A grant of $1,105,000 in 1965 made it possible to move this service organization from NET in New York, where its growth and tenure were both limited, to the University of Indiana, where the growth potential was greater and the working conditions more favorable. The University of Indiana Foundation invested a substantial amount of money in support of the NITC, and this, together with the Title VII grant, gave the center a chance to become self-supporting. It now makes a number of high quality instructional programs available by rent to schools and colleges throughout the country and produces some instructional programs of its own where suitable material to satisfy apparent current needs does not seem to exist. During the period 1965-1970, the school population reached by NITC telecourses approximated 17 million youngsters in grades K-12 and an additional 150,000 students via higher education or in-service teacher training programs.

*The Great Plains ETV Library.* A grant of $506,000 gave this institution an opportunity to expand its services to a self-supporting operation. Like the NITC, the Great Plains ETV Library makes it possible for schools and stations to exchange some of their best programs, and thus contributes to raising the average level of available instructional television. Its primary area of service is made up of the middle states of the continent, although both the NITC and the Great Plains Library have distributed their material nationally.

*The Northeastern Regional ITV Exchange.* Grants totaling $355,000 to the Eastern Educational Network permitted that organization to study the needs, resources, and methods for exchanging instructional television programs in the Northeastern states, and to establish a working exchange between the various users.

Did it give rise to new educational/informational institutions?

Title VII made a significant contribution to the development of the *Educational Research Information Center* (ERIC). In the 1960's, it became apparent that the numerous individual researchers in education needed a comprehensive system by which to assemble their research results and make them easily available to fellow researchers and other users. The sciences (physics, chemistry, psychology) and other specific areas of knowledge were already moving toward such systems.

Under Title VII, Western Reserve University received grants totaling $368,000 to make the basic studies for a national network of information centers which would furnish bibliographies, abstracts, and complete reports on current educational research. Such a system was sketched out under the contracts; a thesaurus of educational terms was prepared so that reports could be fully indexed for complete retrieval; and a pilot operation was undertaken to try out the methods. From this has grown the ERIC system of 23 clearinghouses, each one handling a different area of educational research--abstracting the research in its area, and making it available on microfiche or full-printed copy. The system is also computerized to speed searches and to obtain printouts of information. With an initial grant of $175,000 from Title VII, the first ERIC Clearinghouse on educational media was established at Stanford University, and it has been providing a national service since 1967.

Nine university-sponsored educational research and development centers are now in operation in the United States. These were established with the aid of the Office of Education in the late 1960's. They grew out of the increasing realization that merely telling educators about new research results was not sufficient to bring about any broad changes in school practice. One of the links that seemed to be needed was an institution that would combine research on educational problems with the development of methods and materials for the classroom. One of the prototypes for these research and development centers was funded under Title VII by a grant of $400,000 to Dr. Robert Glaser at the University of Pittsburgh. A blueprint for this type of center had been explored in a Title VII activity undertaken by the Oregon State Education Department.

Not only did this set a pattern for such centers, but the University of Pittsburgh Research and Development Center continues, specializing in the individualizing of classroom instruction (i.e., I.P.I., Individually Prescribed Instruction)

and working with a number of schools in the Pittsburgh area and elsewhere. An example is the Research for Better Schools, a USOE Regional Laboratory.

In 1961, a grant of $25,000 to Professor C. R. Carpenter at Penn State resulted in blueprints for another kind of institution intended to design, develop, test, and introduce new instructional systems. Out of this, in part, have come the 15 *Regional Educational Laboratories* established by federal funding and working closely with school systems in their respective areas.

Thus, there is little doubt that Title VII's contribution to the conceptualization and "foundation building" of the new educational research and information dissemination institutions, that have emerged in the 60's has been important.

What contribution did Title VII make to the main ideas of the educational ferment?

It must be remembered that Title VII was restricted by the terms of the legislation and by its committee's interpretation of the terms as to what it could do. It could foster research and dissemination of research results, but it could not support the development of teaching materials, except as they were to be used in research or demonstration. Thus, for example, televised lessons in elementary Spanish made by the Denver Public Schools for use in a Title VII research project happened to be picked up and used by certain other schools, including the New York City School System; but Title VII could not fund a project primarily aimed at the development of these materials. Similarly, a contract in Texas permitted the making of a series of transparencies which were later used very widely in Texas classrooms; but the contract was for demonstration not development.

Again, Title VII was not intended to be used for the development of equipment--it was not designed to contribute to the making of better projectors, or the developing of techniques for cassette-loading of film, or for the design of cheaper computers for instruction. It could contribute to the more effective use of such tools, but essentially it had to contribute rather indirectly to the activity--either by helping to build institutions to speed the ferment, by bringing competent people into the field to work on topics related to the new area, or by furnishing ideas that would enter into such a catalytic process. Since Title VII clearly made contributions through people and institutions, what can now be said about the thrust of its main ideas?

The "system approach" to instructional technology. This became perhaps the central idea of Title VII. One dollar out of every six that Title VII expended went for studies of combinations of media. One of the influential projects under the Title was conducted by Leslie J. Briggs and the American Institute of Research on procedures for the design of multimedia instruction, and a review of the existing research (see Appendix for a listing of all Title VII projects and project directors). An early contract to Stanford University and the Denver schools was allocated for studying the "context" of instructional television--that is, what other classroom and home activities and resources could be combined with television programming to make the most effective total system. Robert M. W. Travers made a very important study on the theory of presenting instructional information through many combinations of media--some to be used simultaneously. Professor Carpenter, at Penn State, sought more effective ways of presenting given subjects by media. Dr. Finn, at USC, surveyed systematically the technological resources available for teaching in the United States. In fact, the system idea of determining which medium (including the teacher) might be best for which task, came to be so generally accepted as basic in Title VII work that it was taken for granted without arousing special attention or discussion and incorporated both into many research projects and into institutes, conferences, and demonstrations. This point of view was reinforced through continued funding, a point which was bound to be observed by researchers, students, and schools. It also was accepted by, and became one of the key ideas of, the Commission on Instructional Technology, which said in its summary statement:

> Our study has shown that one-shot injections of a single technological medium are ineffective. At best, they offer only optional "enrichment." Technology, we believe, can carry out its full potential only insofar as educators embrace instructional technology as a system and integrate a range of human and nonhuman resources into the total educational process.

The idea of individualizing instruction. Like the system idea, the individualizing aspect was salient throughout Title VII. Most of the studies of programmed instruction, during the time when Title VII was chief funder of such studies, were directed toward individualized instruction and self-teaching. An important series of studies by George L. Gropper and A. A. Lumsdaine at the American

Institutes of Research was concerned with procedures for individualizing group instruction by television, chiefly by using programmed methods. Robert M. Gagne studied the use of visual graphic presentations to achieve greater learning and retention for children with different abilities and backgrounds.

A whole series of special audiences were the subjects of Title VII studies, aimed at finding out what technologies and materials would best serve them. Among the groups studied were blind children (George D. Mallinson, Western Michigan); the illiterates (Nell Peerson, Alabama); those with speech and hearing defects (Jack W. Birch, Pittsburgh); and the mentally retarded (James E. Price, Alabama, and Alden S. Gilmore, South Florida). Rose Mukerji conducted a national demonstration project on the use of television for instructing students who came from culturally disadvantaged homes. The studies of programmed instruction gradually merged into studies of computer-assisted instruction, anticipating the day when lower costs of computer use will make possible a really extensive individualization of classroom study.

Some of the know-how and materials developed within the Title VII framework are also beginning to appear as school districts and various organizations enter into performance contracting arrangements, linking the individualized and accountability dimensions.

Updating of curricula. As we have noted, the production of teaching materials was not included directly in the mandate of Title VII. However, the presentation of mathematics via the media was studied under Title VII by Lawrence Stolurow, Illinois; Max Beberman, Illinois; A. Harvey Block, Morgan State; John Church, State University of New York; and Patrick Suppes, Stanford, among others.

Science teaching by means of media approaches was studied by Edward E. Bryan, Oklahoma State Department of Education; John M. Gordon, Michigan State; Keith A. Hall, Penn State; David J. Klaus and A. A. Lumsdaine, American Institutes of Research; W. James Popham, Kansas State College, Pittsburgh; Chris G. Poulos, Wisconsin; and Alexander Schure, New York Institute of Technology.

The programming of foreign languages was studied by a number of scholars, including James J. Asher, San Jose State; Emanuel Berger, Pennsylvania State Department of Public Instruction; Elaine L. Burroughs, Hollins; Ralph J. Garry, Boston; John Hayman and Dale Barcus, Denver Public Schools.

Among other subjects studied from the standpoint of instructional technology, under Title VII, were medicine (Preston Wilds, Georgia, and Frank M. Woolsey, Union University, New York); dentistry (W. Allen, USC, and Arthur H. Morrison, State University of New York); engineering Davis R. Entwisle, Johns Hopkins; William H. Huggins, Johns Hopkins; James G. Knudson, Oregon State); English (C. Dwight Dorough, Houston); reading (Evan Keislar, UCLA); economics (J.Sterling Livingston, Sterling Institute); music (Edward Maltzman, Music Education Association); spelling (Constance E. Meyn, and Wendell Smith, Bucknell); health sciences (Theodore S. Grant, University of California, San Francisco).

One of the more interesting demonstration and teaching projects was the planning, construction, and evaluation of media for teaching high school and junior college students by TV and by self-instructional methods, done under the direction of Harvey White at the University of California, Berkeley. Therefore, primarily through the general elements of the process and procedures of product development (even though it was not written specifically to create materials) Title VII gave major attention to the problems of updating curricula and curriculum materials.

Updating teachers in the use of learning resources. Although the Educational Media Institutes for teachers in service were financed under another title, Title VII was constantly concerned with helping teachers use media more effectively and with resolving and overcoming teacher reistance to the use of media. Two conference studies, under the direction of W. Meierhenry at Nebraska, explored the competencies needed by teachers for the effective use of newer media, and various approaches to achieving such competence. Also, methods of gaining acceptance of newer media in education were investigated. Ned A. Flanders, of Michigan, studied at a more basic level how teachers can be helped to change their teaching behavior. Richard I. Evans, at Rice, studied the factors involved in a specific university faculty's resistance to instructional television. George Bondra, at Mt. Kisco, studied procedures by which a media atmosphere could best be used to change the teacher's role from one disseminating information to guiding individualized learning activity.

A number of Title VII contracts dealt with the pre-service preparation of teachers. A contract awarded to the American Association of Colleges for Teacher Education supported a broad study on the use of new media to "improve the professional sequence in pre-service teacher education." Bert Y. Kersh,

of the Oregon System of Higher Education, developed and tested an ingenious system of films which required pre-service teachers to react to classroom problems, and then showed the probable result of their chosen response. Robert J. Keller, of Minnesota, studied the use of closed-circuit TV in teacher education. W. Warren Kallenbach, at San Jose State, worked on a contract to evaluate the effectiveness of microteaching whereby videotape recorders provide vignettes for neophyte teachers of their own performance for critique in the preparation of elementary school intern teachers. F. Craig johnson, of Ohio University, investigated the use of motion pictures to improve the training of TV teachers.

A number of studies were also aimed at improving the in-service training of teachers. For example, Max Beberman, of Illinois, tested the effectiveness of a series of filmed demonstrations in preparing teachers to use the new math. Donald W. Johnson, of Penn State, developed and tested a videotaped in-service course in educational psychology. A large project under the Texas Educational Agency tested and evaluated the effectiveness of traveling teacher demonstration teams designed to instruct in the use of new media.

## WHAT CAN BE LEARNED FROM THE TITLE VII EXPERIENCE TO GUIDE FUTURE LEGISLATION

### Observations and Recommendations

About deriving maximum classroom effect from a research program. Were the expectations for Title VII unrealistic? Yes, if research and disseminated information about the results were expected to lead to swift and sweeping changes in the American classroom. Swift changes of any kind are contrary to everyday experience with the American educational system. The hope that dramatic change could be brought about simply by telling schools about research findings is contrary to everything that has been learned about the process of educational innovation.

There are indications that many who were involved with the program felt that Part B was the weak link in Title VII. This opinion needs to be closely scrutinized. Although Part B was the "ugly duckling" of the program and received the least attention, until the middle and later years of Title VII, its successes may have been very different.

Nonetheless, in terms of the visible "monuments" Title VII left behind, the institutions built under Part B were more visible than anything left by Part A, the useful results of which are very hard to measure on a short time-scale. Although less was done than was desirable to make public the results of Part A research, still the basic trouble seems to have been less with the results obtained under Part B than with the concept of Part B.

The Part B concept was based on a rational model of educational change; that if the school system is informed of the results of educational research it will hasten to translate them into practice. The question is whether this is a realistic expectation?

In the last century there have been a number of swift and significant social changes arising from medical or technical innovation. For example, there was the development of insulin, polio serums, and antibiotics. The production of hog cholera serum was a turning point in the growth and acceptance of the United States Agricultural Extension Service program. The rapid acceptance of the automobile and of television have led to great changes in the life styles of our society. But in none of these cases was research translated directly or quickly into popular, or even practical use. The basic research was followed by a long period of development, evaluation, and testing before a product could be

presented for adoption. Furthermore, in many cases these innovations required little expenditures of effort from users.

Comparing the above described process of change with the type of change that Title VII was trying to bring about reveals vast and basic differences. One should note that even the difference between the way Part A and Part B of Title VII worked was great, not to mention their difference from other programs aiming at educational change.

Not only did Title VII do less than might have been done to make available the results of Part A research, it also did (and in fact was able to do) very little about funding the steps in the adoption process that lie between research and use. Until ERIC came into being, there were but limited ways for scholars to discover the results of Part A research other than through the "delayed" articles in professional journals. Printing rules severely limited the number of final reports, and when printing was done through the Government Printing Office, the delay was often several years. Scholars who had grants under Part A were principally interested in the research rather than in disseminating it widely to educators. Many of them found that the effort of trying to get a demonstration, or a conference, or a development project funded after the original research was completed, was more effort than it was worth to them. But even if the researchers had been more anxious to work in disseminating their findings, and if more energy and initiative had been put into Part B, Title VII was still not geared to accomplish very broad or swift innovation in the schools.

This restriction was due to the fact that Title VII could not concentrate research on a given area, product, or problem, nor fund adequately the transition steps between research and school use. Availability of information about the research did not guarantee translation into new practices. More was needed.

At best, information dissemination is not a quick or easy process. In the late 1930's the Mort studies at Columbia Teachers College had estimated that 50 years would pass between the appearance of an educational idea and its wide acceptance as common practice. In recent years it has been found that once sufficient development of an idea has taken place, the diffusion of the innovation takes place much faster than the earlier Mort studies indicated. For example, the first known use of teacher's aides was in Bay City, Michigan, in 1952. By 1961 it was estimated that 9 percent of elementary and 18 percent of secondary schools were making at least some use of them. A recent study (by the Center for Urban Education, New York City) estimates that 200,000 paraprofessionals are

now at work in the schools. Team-teaching was being used by about 5 percent of secondary schools in 1955-56, while an estimated 12 percent used team-teaching in 1960-61. These innovations, of course, were not really the results of basic problems which suddenly became more aggravated by the "baby boom" of the 1950's.

In contrast, consider the concept of teaching reading. Although substantial evidence was gathered that there might be a better way, teaching reading remained relatively unchanged for several decades. The materials available largely determined how reading was taught in the schools, and reader series and manuals maintained nearly nation wide uniformity of teaching methods despite the fact that (as M. Miles asserts in his book Innovation in Education) only "one-third of a sample of reading experts--peers of those who had prepared the materials--had confidence that they were based on 'definite scientific proof.'"

About some recent innovations in curricula and in instructional technology. In 1957 only 46 language laboratories were known to have existed in secondary schools. There were an estimated 5000 of them in use in 1962. What happened to bring this about? The tape recorder was relatively well perfected by 1957, nonetheless later technical developments did make it simpler, easier to use, and cheaper. Drill material was available from years of use in oral classroom practice. Transferring language drill from the teacher to a machine did not especially threaten the teacher; it simply took away one of his most tedious and time-consuming tasks making it possible for students to practice by themselves. Therefore, a product was available of a kind that the teacher wanted. But what really made the difference was the massive infusion of federal funds to help local school districts purchase equipment and the availability of language institutes, and ready-made demonstrations programs, to help the school personnel learn to make effective use of such facilities.

It has been estimated that 90 percent of the high schools in the United States adopted driver education in a span of 18 years. How and why did this come about so fast? For one thing, because little research was needed before one could begin. The materials and methods were neither new nor sophisticated and consisted mostly of manuals of traffic laws, cautions for safety, and practice at the wheel. Automobiles were made available free of charge in most places. What made the chief difference? There appeared enormous community pres-

sure, generated by parents' fears for their children's safety. Moreover, there was strong support by auto dealers, local governments, state highway departments, and insurance companies--even to the extent of reducing premiums to teenagers who had taken a driver education course. Without such broad and strong community pressure, and shift in emphasis on the educational goals, adoption has not gone so fast. For example, it has been noted that it took 60 years to get wide acceptance of the idea that pupils could learn something by studying their own communities.

For years before the 1950's mathematicians had known that other approaches to the study of mathematics had certain clearly identifiable advantages over the approaches used in American schools. The theory for a new approach was available. What was needed was a mammoth project in curricular development. Money for this kind of project became available because of the new educational concerns of the late 1950's and, for the first time, leading scholars were willing to devote time to developing a suitable curriculum, rather than concentrating on basic research.

When the materials were ready, they entered the commercial channels of distribution, and were presented to the schools with the enormous prestige of leading scholars, with the national interest apparently involved, and with a great amount of federal money being made available for conferences, workshops, and in-service teacher training in the new math.

The new curriculum of the Physical Science Study Committee (PSSC) did not grow out of new research, but rather out of the dynamic leadership of Professor Jerrold Zacharias of MIT. In turn his leadership grew out of a general feeling among scientists that high school graduates were coming to the universities with inadequate preparation in science. Then Sputnik unlocked the treasury. Between 1956 and 1959, 4.5 million dollars (equal to one full year's expenditure under Title VII) were spent in designing, testing, and revising of textbooks, teachers' guides, laboratory guides, and all sorts of apparatus, films, and tests. These were tried out in schools, and passed into the hands of commercial distributors in 1960. A total of 250 scientists, teachers, and materials specialists worked on these materials. When they were published, a large amount of federal money was made available for teaching modern physical science to teachers in the classroom. More than 2000 teachers were introduced to PSSC physics by 1961. Estimates indicated that approximately one-fifth of all secondary school physics students were studying PSSC materials by 1963. Yet, even with all this effort of development and application, slightly more than one-half of the teachers who were brought to the institutes did not adopt the new course.

Another case of educational "lag" time is evidenced in the slow acceptance of the theory of programmed instruction. It had been developed out of basic research in learning completed long before Professor B. F. Skinner's famed 1954 article in the Harvard Educational Review drew so much attention to it. That is, it had been known for a long time that a student learned efficiently by practicing responses; that some schedules of reinforcement worked better than others; that it was useful to design a learning exercise around a behavioral objective that could be measured; and that it was possible to construct an efficient learning experience by testing it on students. One of the advantages of the programmed instruction process was that basic and developmental research could go on together. What seemed to be called for, when Title VII came into existence, was a very large and concentrated activity in constructing and testing instructional programs which would simultaneously improve both the theory and materials and then put it to use.

Considering its meager resources and the difficulty that it had in trying to focus research, Title VII contributed considerably to this task. What happened, however, was that expectations for programmed instruction outran the materials. The new method passed rapidly into commercial hands. A false start was made with "teaching machines," thousands of which were sold to schools before there were adequate programs for them. Publishers offered programs that had not been adequately tested. There were no concentrations of scholarly talent such as had been gathered around the curriculum revisions, and no general evaluation of materials. Schools adopted many such materials, and promptly began to have doubts about their quality and value. Simultaneously, teachers found that some programs did not work well at all or else did not fit into their curricula. Furthermore, there were no available funds, as there had been for language laboratories, to help schools buy the necessary materials. In addition, there has been a certain amount of negative reaction to programmed instruction, and presently it achieves only a fraction of its potential contribution to instruction. The chief reason seems to be an inadequate program of development and application to school use.

Individualizing instruction is one of the main currents of the present educational ferment in the overall movement to fit a student's own pace, progress, and needs, and to concentrate the learning on a student's self-directed activity rather than on cramming knowledge into him. Obviously, this is immensely more complicated than, for example, the introduction of a language laboratory, because it involves entirely

new methods, materials, reorganization of schools, and extensive experimentation. Indeed, it constitutes a very broad current of innovation and therefore tends to be resisted because it conflicts with the existing structures of schools which are designed to handle large groups efficiently. (Individualization, on the other hand, requires a quite different pattern of organization.) Consequently, although the general belief is that individualized instruction is the way of the future, it has barely come into use in a significant number of schools.

The Commission on Instructional Technology, in their 1969 report, titled To Improve Learning, summed up some of the reasons why innovation does not take place in the schools more quickly than it does. For one thing, there is a "lack of practical understanding" about the process of human learning. (Charles E. Silberman, Director of the Carnegie Study of the Education of Educators, wrote that "the degree of ignorance about the process of education is far greater than I had thought. Research results are more meager or more contradictory, and progress toward the development of viable theories of learning and instruction is far slower.") Secondly, there is insufficient money available for innovation, thus only a small fraction of school budgets is ever available for any form of instructional materials. Thirdly, the structure of today's school system--grades, courses, credits, departmentalization--leaves limited leeway for any considerable innovative change, not to mention the tradition of awarding teachers' salary increases solely based upon longevity instead of on some measure of ability to obtain observable improvement in student performance. When federal funds are pumped into emergency needs, most of them are used to repair and maintain the old system rather than to devise new systems and methods.

Looking more specifically at the obstacles barricading innovation, the Commission on Instructional Technology has noted that: (1) there is an indifference or antipathy toward using technology in education (Professor Elton Hocking reported that "Many administrators of school districts, colleges of education, universities, or state education departments regard technology as a kind of profanation of the classroom"); (2) the programs and materials that are available are often of a poor quality; (3) the existing new equipment that is being offered is inadequate (Howard J. Hausman, of the National Science Foundation, wrote that "the hardware is really in a never-never land of great promise and disappointing achievement."); (4) when a school has obtained such materials as films and such tools as projectors then far too often they are inaccessible to the user; (5) teachers are usually not trained in taking

full advantage of instructional technology; and (6) it must be realized that the few media specialists that are on school staffs usually have very little to do with the central curriculum planning.

The lesson to be drawn--one that is strongly supported by the Title VII experience--is that there are many steps between an innovative idea that emerges from research and the successful use of such an innovation in the classroom. Telling people about research results is only a tiny step along the road.

As a matter of fact, Title VII developed several effective ways of "disseminating" results--notably the ERIC system, but also the system of abstracts and interpretive studies. But even if the dissemination effort had been more effective than it actually was, very substantial efforts would have to be made in the development, application, and feedback of experience data to guide further research and development.

In another sense, Title VII, through its involvement of students in its projects, also disseminated "know-how" about innovations. A review of Part A and B projects (where student numbers were listed) revealed 137,000 youngsters, from preschool through higher education, had clearly participated. Add to this total the number of preschoolers viewing Sesame Street, the over 17 million watching NITC programs, the large number of students involved in reuse of materials developed as part of the Part A activities or the Part B dissemination efforts (i.e., the work at Pennsylvania State University), the total becomes very impressive. Necessarily, all of this would have had to intervene between research and the classroom.

It's easy to expect too much of research. As an example, consider some of the steps that an innovative process might have to surmount after successfully emerging as a sample of Title VII research, not necessarily in this order, or including all these steps:

Additional research, to remove the uncertainties and restrictions and to sharpen the idea to the point where it is ready for development.

Development and testing of the software.

Development and testing of the hardware.

Reliable evaluation of both software and hardware, so that they could be confidently recommended as a working unit.

Demonstration, so that the innovation could be observed in action by potential users.

User training, if needed, for the personnel who would use the innovation.

Securing financial aid, if needed, to help users such as school districts, acquire the materials, equipment, or personnel required for use of the innovation.

Making expert consultation available, if needed, to help with local application and adaptation.

Providing for an ongoing system of feedback, to broaden the evaluation of the new method or materials by reporting back to the researchers and developers information about actual use "in the field." This would make possible further revisions and improvements in the innovation.

Establishing management structures and processes, to facilitate the implementation of the innovations. Some consideration must be given to methods and means for providing the "river bed" in which the innovation may flow.

This long process, which is outlined above, has been recognized by the chief students of innovation, and in the principal plans established for speeding educational change. For example, when California decided to make a major effort to improve the teaching of languages, science, and mathematics, with the aid of Title III funds, the State Department of Education found it necessary to do a minimum of three things: (1) share costs with local systems, (2) furnish expert consultation to guide local systems in adaptation and modification, and (3) help local systems test the effectiveness of their innovations. All this was deemed necessary even though the particular program that was selected picked up the innovative process at a point in time when development of materials and methods was supposedly completed.

In this perspective, some of the most farsighted grants of Title VII may have been those that helped establish the research and development centers and foreshadowed the regional laboratories which would carry on the research, development, and application processes beyond the point where it had to be left by Title VII. Another particularly successful example of this type of Title VII contribution would be the support it provided to institutions like the instructional television

libraries that would serve to validate and make easily available superior instructional materials.

In retrospect, the legislation failed to provide adequately for the steps beyond the initial research in the innovation process. And it appears that a principal lesson to be learned from Title VII experience, to guide future legislation, is the following:

> *Future legislation built on research and aiming at rapid educational improvement should provide mechanisms for the integration of research into a much broader program for achieving change.*
>
> *In particular, the legislation might profitably make provision for research at different stages of the process--basic studies, development testing, application, evaluation, and feedback from practitioners. It should provide, either within its own program or in close cooperation with other legislation, for such research-related activities as development of materials and equipment if needed, demonstration, guidance and assistance to school systems in acquiring necessary materials and equipment, and for the training of teachers to use them. It also might provide for sharing the expenditures of innovation and for cooperative activity with state departments of education and local systems.*

These deficiencies in Title VII were recognized and considered in later legislation such as ESEA and EPDA. The experience gained from these later efforts should be incorporated into any future legislation.

> *In order to simplify the translation from initial research to the rest of the innovative process, it would be useful to require all research projects to devote some time to documenting how the project outcomes might be translated into practice. The researcher himself need not be the person who implements or applies the results of his research. Where appropriate, however, a contractual arrangement might call for a research report, dissemination, the development of prototype products, and their application to a practical situation.*

About "categorical legislation." One of the questions most frequently raised about Title VII is whether this kind of categorical legislation is as productive as allocating the

same money into a general research program such as Cooperative Research. The argument on one side is that a highly focused research program in one area, such as media, tends to be isolated from ongoing work on other aspects of education. On the other side, it is argued that categorical research is necessary to concentrate effort and to give a boost to a specific field of educational study at crucial times. Title VII seemed to satisfy proponents of both viewpoints. It was specific but remained in the mainstream.

Little evidence could be found to suggest that Title VII research suffered from the researchers not being involved with what was going on elsewhere in the educational process, or from being isolated from studies of the substance, as distinguished from the method, of education. The categorical quality was not found to be the chief restriction upon Title VII. Rather, what acted as a restriction was the fact that Title VII was organized with but an incomplete idea of the innovative process which must account for all its component parts. It is probable that categorical legislation of this kind should have a limited life and then be absorbed into broader programs, as Title VII was.

During its lifetime, Title VII clearly did give a boost to the field of instructional media and technology, did bring new people and institutions into the field, and did create institutions to carry on after its expiration.

> *Categorical legislation of the kind represented by Title VII can be useful in the future when it is desired to give a special push forward to some field, or other specific aspect of instruction, provided that the legislation is not drawn so narrowly as to isolate the work done under it from the mainstream of educational ideas, research, development, and application.*

About control over research topics. One of the features of Title VII that proved wasteful in certain respects, and frustrating to persons in the program who wanted to speed innovation, was the requirement that the initiative for Part A research proposals should come exclusively from the proposers, and that the U. S. Office of Education or the Advisory Committee should themselves take no initiative in focusing and inviting research on a few key topics.

Any research program aiming at advancing a field of knowledge should, of course, allocate some of its resources to men rather than topics, and to promising research ideas whether or not they fit into clusters of ongoing research. To do otherwise

would cut the program off from promising sources of new insights. But the question is whether a mission-oriented program should not be permitted to cluster a large part of its research, thus enabling more efficient use of resources to accomplish the mission. For example, a cluster of related research projects would help to sharpen findings and would lead more quickly into the development phase. The timing for this type of activity would depend upon the maturity of the field. If many new ideas are desired, then the less constraint on the purposes the better. If a refinement of a range of products already developed is desired, then more programmatic efforts are required. Title VII needed the new ideas, initially. The research needed for later phases of the innovative process--development, evaluation, application, and dissemination--would also seem to depend on the effectiveness of the central initiative.

The percentage of the research in a mission-oriented program that should be free-wheeling is something that cannot be estimated here. It seems clear, however, that efficient advancement of such a program will require central commitment of a greater part of the resources to limited priority lines which are then more likely to be carried through from idea to application. It is suggested that:

> *Limited resources will be used more effectively for research in future legislation of the Title VII variety if, after new ideas begin to emerge, a considerable portion of them can be concentrated by developing a research program, focused on a limited number of high priority projects.*
>
> *A greater amount of control over the choice of priority areas for mission-oriented research might profitably be concentrated in the U. S. Office of Education, or a comparable level of initiative, working with a task force of researchers and practitioners. Half the prerogative should be given to individual researchers to propose studies that do not cohere with other work, and consequently, do not necessarily indicate an immediate contribution to the bulk of important knowledge. This procedure would tend to maximize the use made of available funding resources.*

About development of materials and equipment. Title VII made almost no direct contribution to the development of, and less than might have been expected, to the specific production of widely used curriculum materials. For

example, the large programs of curricular revision in the late 1950's and 1960's went forward without much direct help from Title VII. Title VII had little also to do with the technical developments that promise to have a considerable impact upon instructional technology--8 mm. film and film projectors, cassette loading tape recorders, and inexpensive videotape recorders. Yet successful innovations require that materials and equipment of these kinds be made available. It is suggested that:

> *Future legislation in support of educational innovation should provide funding (wholly or partly) for some high priority development activities at a level adequate to carry through all the developmental steps from conception to ultimate application by the general user.*
>
> *Such projects should not only allow for the original research and product development phases but should include provisions for initial periods of controlled use of the products in actual school or institutional settings so as to provide for effective feedback channels for product evaluation and subsequent redevelopment. Thus, when such feedback indicates needs for revisions or for additional software, then improvements could be solicited from interested manufacturers. A development project involving hardware should also provide for a coordination link to assure more effective use of the resultant product. Close examination also should be given to how programmatic product development is being undertaken in currently supported OE efforts such as the regional laboratories and R&D centers directed toward product evaluation.*

About making maximum use of existing knowledge. At the beginning of Title VII, relatively little experience was available with research programs such as those encouraged by the National Defense Education Act. There is now a considerable amount of information and this should be utilized in formulating any future legislation. One of the things found out was that available knowledge in the field was being inadequately utilized. The creation of the Educational Resources Information Centers (ERICs) was a useful, though incomplete effort, to remedy the situation. As steps toward a more complete solution, it is recommended that:

*Any future legislation for research and application studies should endeavor to take maximum account of both the research that has been done and the experience that has been gained with regard to the subject matter to which the act is directed.*

*The legislation should stipulate that an initial study be conducted in which information about the current state of the art should be compiled, evaluated, and summarized for presentation in forms usable at different levels, such as those of the researcher, the manufacturer, and the teacher. Some agency similar to the regional laboratories might well be used to research and gather field experience data and compile it for feedback to a central unit for processing and distribution.*

*The ERIC system might well be supplemented by special units or task forces to process the above-mentioned research findings for use at different levels of educational needs.*

About accountability. Although Title VII did stress the idea of accountability and evaluation, future legislation should do even more. Particularly, in terms of developing better and more consistent schemes for accounting for results..... reports of cost-benefits should be encouraged in connection with innovations. Most professionals are concerned about accounting for the outcomes of their efforts. and are willing to cooperate in such reporting, provided meaningful methods are available. In the past, they have seldom been asked to do so. In summation, it is suggested that:

*Future legislation should stipulate that more of the projects require an accounting by project directors of the accomplishments of their efforts including a precise statement of the goals and objectives sought, their impact on classrooms, the dissemination of these results, and so forth. Cost-benefits measures should be fully incorporated into projects that include the application and use of an instructional innovation. However, leeway should be provided occasionally for the exploration of such project goals which might not yield any impressive cost effective outcomes.*

*Future legislation of this kind should provide for funding, wholly or partly, high priority development activities that carry through all the steps to final application and that also provide for feedback of results.*

*Future legislation should provide for evaluation of projects (and the overall program) so that researchers and program planners can understand what was tried and what was accomplished. Standarized descriptive language (See OE Standard Terminology Handbook Six) should be required at both project and program levels. Cost effectiveness concepts should be used increasingly as one way to attain accountability.*

## WHAT CAN BE LEARNED FROM THE TITLE VII EXPERIENCE TO GUIDE THE ADMINISTRATION OF FUTURE PROGRAMS OF THIS KIND?

Numerous groups interacted with Title VII. Like the blind men describing the elephant, each participant could report only on the part of the program that he touched directly. Consequently their perceptions of the program did not wholly agree. For example, the staff of the Office of Education Media Branch had one set of opinions; the top administrators of the Office of Education had another; members of the Advisory Committee a third; and the directors of the various projects a fourth. Within each of these groups there was less than complete agreement. Yet, while opinions and perceptions differed, the observations overlapped on a series of key issues.

This study has tried to derive a balanced analysis of the administrative procedures and problems of Title VII by means of long interviews, questionnaires, or statements from each of the groups who were in a position to know the Title VII program best.

Needing to deal with apparently variant and conflicting inputs, the study made extensive use of an "intersect theory of analysis" approach in an effort to approximate "objective reality." Using such analysis the areas of overlap (or intersect) are purposively searched out and serve as focal points for analysis. When faced with a profusion of opinions, this is a sound approach to use. (Figure 9 attempts to provide a schematic which reflects the intersect, or overlap, theory in its simplest form.)

As expected, the comments and answers did overlap on certain key problems--notably on the functioning of the central staff and the Advisory Committee, the relationship of the committee to the Commissioner of Education, and the importance of the field readers. Moreover, where there were differences of opinion on these matters, both within and between groups, an effort was made to identify the overlap and to analyze the emerging patterns of consensus as well as of disagreement. In some respects, the differences were even more revealing than the points of consensus.

The following observations and recommendations have been derived from this kind of "intersect analysis." The degree of agreement on the key problems and what to do about them, that is evidenced in all the sources, has been most encouraging to the project staff.

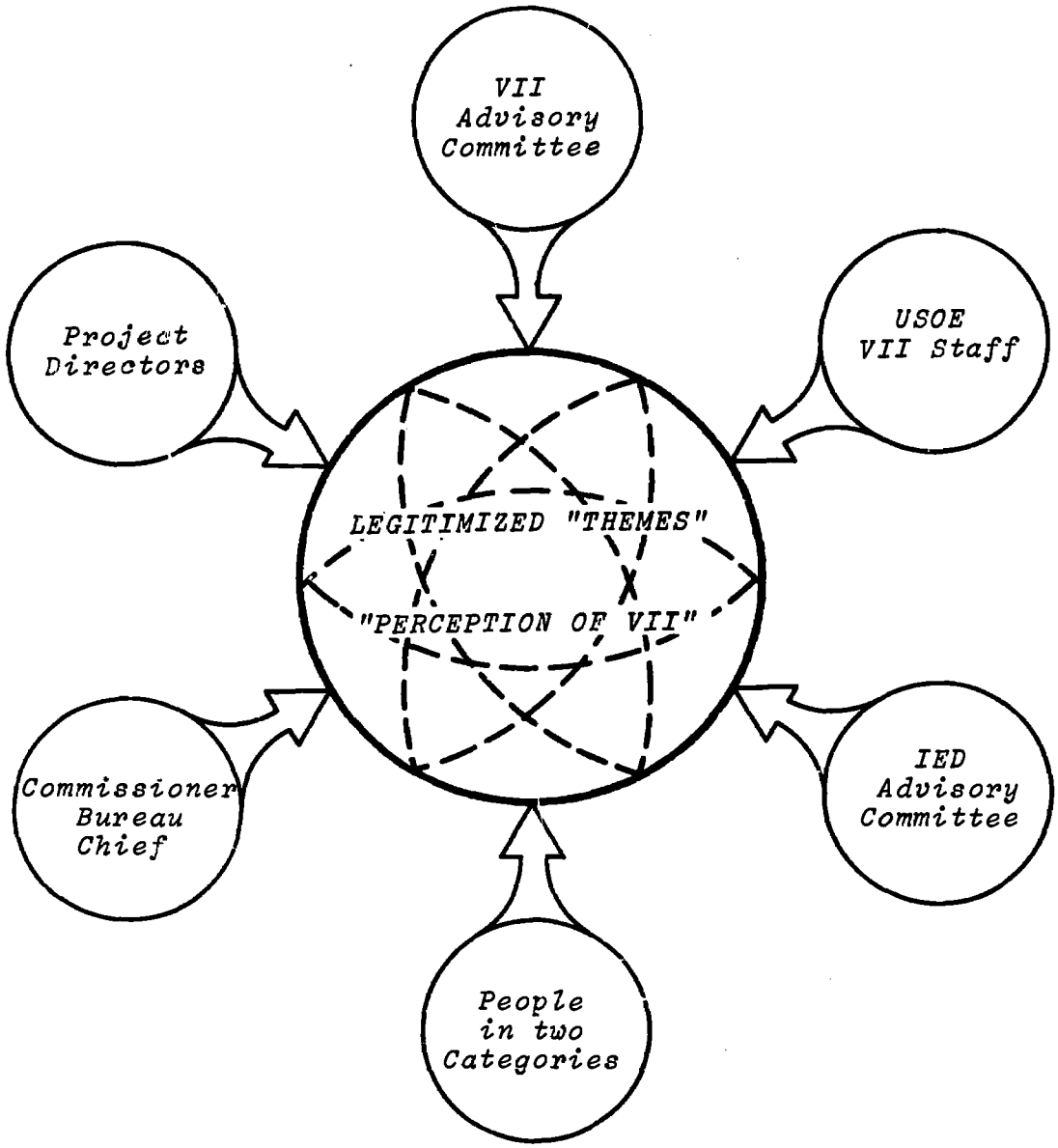


Fig. 9. A Schematic of the Intersect or Overlap Theory

## Observations and Recommendations

About the Central Staff. The top U. S. Office of Education administrators, the Advisory Committee, and the project directors almost unanimously said that the program was administered well. One of the top O. E. administrators who had been close to Title VII reported it had been guided in some instances more creatively than other branches within the Office of Education. Also, most members of the Advisory Committee felt that they had received excellent staff support. Similarly, the Project Directors reported, for the most part, pleasant and supportive relationships with the Title VII staff.

There were reservations as regarded the limited size of the staff, its lack of continuity, and the insufficient numbers of specialists familiar with the highly varied topics considered under Title VII. More importantly, effectiveness of the staff was hampered by frequent changes in personnel and reorganization within the office. This was especially bothersome to the directors of the Title VII projects and would be an important consideration in the effective implementation of any future research and development effort.

Complaints on this count reappeared time and again throughout the interviews: "Change of personnel in the Office of Education was too frequent and caused the repetition of the same questions over and over again," or "We needed consistency in project officers in O. E. We had five different ones--each time there was a new ball game."

A project director said, "We had four different project liaison men during 18 months experience with the office."

One problem was all the staff members were rotated rather frequently," reported a member of the Advisory Committee. "This meant that between meetings one never could be sure to whom to turn with questions about any given proposal or subject area."

In a somewhat less kindly tone, one director said, "There should be better and more experienced personnel who would stay on the job long enough to find out what was going on."

The call for a wider range of specialists in media in the central staff was echoed in numerous cases. "There should be a small high-quality, well-paid staff with as much autonomy and as free from USOE red tape as possible," said one project director. "More consultant staff," demanded another; "More *professional* staff," said a third.

On the other hand, staff members themselves recalled that they needed more skilled secretaries; and some felt that a contracts officer on the Title VII staff could not deal with the legal and fiscal staff of the Office of Education. Thus it seemed that there was a definite need for more people with expertise in legal matters and there was a constant need for someone to handle the continuing flow of information from Title VII staff to the academic community.

"All professional positions of USOE should have been staffed by experienced media personnel on a continuing basis without the constant USOE administrative juggling and reorganization," appeared in one interview.

Both the frequent reorganizations and the lack of an attractive career pattern for professionals in the Office of Education were noted by many respondents as the cause for the high-turnover in staff positions. The reorganizations were seen as disruptive to both program continuity and to consistent goal-setting for the overall program. In particular, the reorganization of 1965 had a crippling effect on the program just when the fruits from earlier years were being harvested.

Another respondent stated: "Probably the major problem in USOE is the lack of permanent qualified staff...Almost everyone I came into contact with was dedicated and overworked; they were also anxiety-stricken by the revolving commissioners and the rumors and reverses. Of four key competent persons I knew well over several years, only one remains in the USOE today."

Concerning the central staff of a program committed to research, development, and application of innovative approaches in education, the following guidelines are suggested:

> *A guaranteed tour of duty longer than two years must be assured so that the professional staff will have an opportunity to review, evaluate, and modify the selection procedures based upon project outcomes. Provisions should be included to assure continuity, familiarity, and overlap for at least a portion of the staff with even the longest-lasting funded projects.*
>
> *It would be useful to have a careful review and structuring of career development patterns within the Office of Education in order to attract and hold highly qualified personnel. To help "capture"*

*such personnel, a guaranteed leave period, such as two months each summer or four months every two years, might well be provided. By offering such sabbatic leave to USOE personnel, these professionals would not be faced with the diminution of their professional standing, competence, nor would they be placed at a competitive disadvantage.*

*Future programs designed to administer legislation dealing with research and dissemination of innovative approaches in education should include in their staff some of the following types of personnel.*

- *A person experienced in evaluating research designs.*
- *A person experienced in training people in the effective use of innovations and in their introduction into the classroom or lowest denominator of instruction.*
- *A person with practical experience in the use of either educational technology or with innovative methods and techniques at the elementary, secondary, and higher education levels.*
- *A person knowledgeable in product development and of the technical requirements of the new approaches.*
- *A contracts and fiscal officer who would either be assigned to the project staff or maintain an "educational technology" desk in the contracts office, especially if the unique dimensions of the innovation (i.e., new equipment, etc.) require special contract arrangements.*

*The assumption here is that there is a concern with providing salaried positions within the legislation to adequately staff new programs for which monies are appropriated.*

*Provision might well be made to establish "visiting chair" appointments in the Office of Education for leaders from the fields of education, industry, and research, who have expertise in educational technology or the area under concern. These persons could serve as consultants to the staff as well as to personnel in the field.*

*Incentives comparable to those commonly offered to high-caliber research scientists should be established for professionals who are competent and willing to devote the major portion of their time to the combination and coordination of research findings and developments, dissemination, and implementation, rather than to original research.*

About the Advisory Committee. As noted before, probably the most unusual feature of the Title VII legislation was the provision for an Advisory Committee whose approval was required before any Part A project could be supported. There was considerable disagreement about the usefulness of this committee.

In general, the Office of Education staff viewed the committee as being less than fully utilized, although recognizing the dedicated service of many committee members and the particularly useful advice and assistance of a few of the members. This attitude was perceived by at least some of the members, one of whom said he "had the feeling that the committee was simply tolerated by the staff."

Committee members themselves differed widely in their estimates of the usefulness of the group. It is perhaps noteworthy that the most favorable and the least favorable comments from former committee members were the shortest, whereas the longer and the more thoughtful replies recognized both strengths and weaknesses and usually pointed to the locus of the committee's problems in the definition of its role.

The ability of the Advisory Committee to give useful advice on policy matters to the central staff was recognized, and in this respect the general opinion was that it was helpful to have representation from different constituencies rather than from only research men, educational administrators, or teachers. However, the chief assignment and preoccupation of the committee for much of its history was to review and pass on Part A proposals. For this, it would have been helpful to have more members who were competent in dealing with the technicalities of research. One former member spoke of "one flaw in the structure, namely that there was no explicit provision for individuals on the committee with sufficient expertise in research techniques and possibilities to evaluate properly the reports of the field readers."

Another recalled, "there were never more than two or three people in the group at any time, at any given meeting, who knew anything about research proposals, that was a rather serious defect." It led easily to frustration both in the committee and in the staff.

The intent of the legislation had apparently been to give the citizens' committee "teeth"--in effect to give it veto power over the Commissioner of Education. This was doubtless somewhat irritating to the Office of Education even though realistically it must be said that the commissioner in fact, acting through his staff, did have final approval authority as well as responsibility for the projects funded under Title VII.

The Advisory Committee seldom went against the recommendations of the staff and the field readers. On the surface, however, it appeared that it was spending most of its time and energy on the work it was least well equipped to do. The minutes of Advisory Committee meetings show that much of the meeting time was devoted to technical and procedural matters--such as proposal budgets, terminations, resubmittals, and so forth. As one former member noted, "committee members were trying to give advice on policies and the general shape of the OE program...but it was very difficult to get anything but details or specific grant recommendations on the agenda."

Some questionnaire respondents suggested other approaches to the problem of providing expert research guidance and project review. One of these suggestions was the creation of task forces, specializing in different areas of educational technology. Another was that the commissioner should be able to appoint one or two short-term ("wild card") members to the committee, as needed, for a clearly limited term so as to supplement the expertise of the committee in a given area of timely importance.

In general, then, the conclusions of the people closest to the Advisory Committee were that a broadly representative committee was a good one, but its most useful function would have been policy advice rather than project approval.

The following guidelines are suggested as a reflection of all the comments and constructive suggestions that were surveyed

regarding the Advisory Committee:

*The concept of an Advisory Committee with broad representation from different educational and technological sectors seems to be a sound one to incorporate in future legislation, but such a committee should be used chiefly for policy and programmatic guidance rather than project approval.*

*The tenure of an Advisory Committee member should be at least three years in order to provide for continuity and reassessment of earlier decisions in light of the outcomes of the approved projects. It would be valuable for the committee to meet at least three times a year, two days at a time, rather than twice a year so as to hopefully amortize their potential in aiding such a program.*

*Future programs of this kind should benefit from the availability of special task forces to supplement the expertise of the Advisory Committee and staff, and to provide broader representation from the educational technology field as well as greater ability to deal with substantive issues. A task force, for example, might deal with the specific area of individualized instruction, interact with the Advisory Committee and staff, and develop recommendations as to what needs to be done and what attack on the problem appears most promising. Such task forces could be convened and disbanded as required, and certain Advisory Committee members might serve on them to provide a link with the main committee.*

*The Commissioner of Education might well have the right to appoint one or two short-term members to the Advisory Committee to satisfy emerging needs of the program or to provide specialized service of importance at a given time.*

*Future legislation of this kind should clearly place final approval of projects under the jurisdiction of the Commissioner, who is responsible for them.*

About the field readers. The Title VII staff remembered the field readers as "valuable," "irreplaceable," helping to "speed up the selection procedures," and extending the 'political' base of the program." The majority of the staff felt that the competence and personnel of the field readers could not have been matched or equaled within the Office of Education. Appreciation for their work was expressed also by members of the Advisory Committee. It is also worth noting that the pattern of using "study sections" of field readers to advise on proposals has worked well in some of the most effective federal research programs, and that such a system can provide useful representation from the academic and industrial communities. It is concluded that:

> *Field readers should be used in a program of this nature, even if more staff members with research competence can be provided within the Office of Education.*
>
> *Furthermore, field readers should be retained for a long enough period to permit them to observe and benefit from the research outcomes of their decisions. This would substantially upgrade their decision-making competence.*

About the keeping of records. The Title VII assessment revealed a surprising lack of completeness of record-keeping on individuals who had been awarded contracts An inordinate amount of time was required to locate project numbers or the total number of dollars expended on the various projects. Such useful information as the number of doctoral candidates whose dissertations were supported by Title VII or who held research assistantships under various Title VII projects that helped them through their graduate study does not seem to be available anywhere. There is also very little recorded as to what publications or other dissemination activities resulted from these projects. Documents published by the U. S. Office of Education, ERIC Clearinghouse acquisitions, and the special project undertaken by the North American Rockwell Corporation to document Title VII, all point to serious gaps. As one

example of this sort of gap, it is impossible to say with confidence exactly how many projects were conducted under Title VII. It is concluded that:

> *A system of accounting for and taking inventory of projects funded under future programs like Title VII should be established and maintained in keeping with recommended practices of good administration and management.*
>
> *It is also suggested that a record of projects turned down should be kept. Also the criteria that were applied in evaluating grants should be maintained in a fashion that would facilitate any future evaluations, reviews, and analyses of the expenditures of federal funds.*
>
> *To assure appropriate and effective utilization of funds expended for any large scale equipment acquisition programs, checks and balances should be retained by the authorized and mandated agency.*

About the general nature of such programs. Recommendations emerged which would apply to a number of programs in this area. If the intent of a program is to effect change in the schools, and some expectation is identified in this direction, then:

> *Future legislation should require that all research efforts direct some portion of their energies to documenting how the project outcomes can be translated into practice. It should be accepted that the researcher need not be the one who implements or applies the results of the research. Three different outcomes might be required: (1) a research report; (2) developed prototype products; and (3) a demonstration of utilization.*
>
> *Conversely, although the Title VII program provided for research and dissemination, there was little attempted in the way of feeding "use experience" data from the classroom back into the program to aid in continuing evaluation and to provide guidance for the funding of future projects. A number of dissemination or research vehicles currently operational might be utilized for this purpose.*

*The emphasis should be on fewer development funds with a greater commitment to see those trends carried through the entire Research, Development, Application and Feedback cycle. The inclusion of the essential Feedback process in an R.D.A.F. cycle, as contrasted with only an R.D. and A. cycle will provide "wisdom" for the intelligent management of future programs.*

*Regional laboratories should get closer to their public by keeping informed regarding what the practitioners are doing and then analyzing and reporting their findings. The appropriate ERIC Clearinghouses might be given this responsibility. Additional support should be provided to such groups as the Education Products Information Exchange which is devoted to this problem.*

*The legislation should provide for the formation of large advisory committees representing state departments of education, urban school districts, universities, etc., not to evaluate projects but to set or modify the guiding philosophy of the program. Expected results could include relevance testing, readiness feedbacks for OE, and a sense of involvement in research that will predispose favorable recommendations at the school level.*

*More projects should be initiated that require an "accounting" by project directors or recipients of funds regarding the administration of the program, success with projects, impact on classroom, dissemination of results, etc. The value of emphasizing accounting should be viewed in the light of developing a continuous awareness of ones' goals and the outcome to be obtained. As observed in this Title VII analysis, professionals are concerned about accounting for the outcomes of their efforts and are willing to cooperate in such ventures. In the past, however, they have seldom been asked, nor have they been instructed in processes for carrying out accountability activities.*

*New legislation should attempt to integrate currently fragmented federal laws and programs pertaining to the technology which are in effect and also provide adequate funds for a rapidly growing field such as this one.*

# APPENDIX

# NDEA TITLE VII PROJECTS PART A

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| ADKINS, Gale R.<br>BR5-0077 | A study of the critical requirements for directors in educational TV stations. | University of Kansas | 1965–66 | 8 |
| ALLEN, William H.<br>A-422 | A study of the non-linearity variable in filmic presentation. | University of Southern California | 1960–63 | 49 |
| BR5-0741 | Audio implementation of still and motion pictures. | University of Southern California | 1965–67 | 50 |
| BR5-0867 | A ... dy of visual and auditory presentation in dental lecture and lab instruction. | University of Southern California | 1965–67 | 73 |
| BR5-1177 | Learner response, feedback and review in filmic presentation. | University of Southern California | 1965–67 | 68 |
| BR5-1123 | Motion variables in film presentations. | University of Southern California | 1966–67 | 60 |
| BR5-8350 | Exploratory study of form perception as applied to the production of educational media. | University of Southern California | 1966–67 | 9 |
| BR6-1265 | Effectiveness of different combinations visual and verbal presentation modes in teaching different kinds of learning tasks. | University of Southern California | 1967–69 | 97 |
| AMIRIAN, Gerard T.<br>(Garry, Ralph)<br>A-427 | Retention by elementary school children of natural science material taught by TV. | Boston University | 1960–61 | 18 |
| ARCHER, N. Sidney<br>BR5-0889 | Assessment of five conditions of teacher-program instruction. | Department of Public Instruction<br>Harrisburg, Pennsylvania | 1963–65 | 174 |
| ARCHER, N. Sidney<br>A-961 | Administrative and instructional adjustments resulting from the use of programmed materials. | Pennsylvania State Department of Instruction | 1962–64 | 18 |
| ASHER, James J.<br>A-578 | Sensory interrelationships in the automated teaching of foreign languages. | San Jose State College | 1960–61 | 9 |
| A-873 | Vision and audition in language learning. | San Jose State College | 1961–63 | 24 |
| ATKINSON, Richard C.<br>BR5-0684 | An automated primary-grade reading and arithmetic curriculum for culturally deprived children. | Stanford University | 1966–68 | 180 |
| BAILEY, Judith A.<br>A-534 | Experimental investigation of the use of automated instructional devices in teaching elementary latin. | Hollins College | 1960–61 | 3 |
| BAKER, Robert L.<br>BR5-0426 | Application of Guilford's structure on intellect to programmed learning. | Arizona State University | 1964–66 | 32 |
| BALIN, Howard<br>BR5-0802 | Cross-media evaluation involving television and photography in the teaching of endoscopy. | Pennsylvania Hospital | 1965–67 | 167 |
| BARLOW, John A.<br>A-143 | New instructional media, self-instruction, guided instruction and the role of the teacher. | Earlham College<br>Richmond, Indiana | 1959–62 | 151 |
| BAUER, Eric W.<br>BR5-0423 | Exploratory investigation of "Sensory Image Types" in foreign language learning. | Indiana University | 1961 | 3 |
| BEACH, Leslie R.<br>BR7-E020 | Learning and student interaction in small self-directed college groups. | Hope College | 1967–68 | 9 |
| BEAIRD, James H.<br>BR5-0836 | Increasing prediction of teacher's classroom behavior through use of motion picture tests. | Oregon State System of Higher Education | 1965–67 | 62 |
| BR5-0953 | Audiosimulation in counselor training. | Oregon State System of Higher Education | 1964 | 4 |
| BEBERMAN, Max<br>A-158 | Study to determine the relative effectiveness of the use of a series of filmed demonstrations in teacher education for a new High School Math Curriculum. | National Educational TV and Radio Center<br>New York | 1959–62 | 254 |
| BECK, Lester F.<br>A-590 | Assessment of some newly designed educational programs for the self-teaching of young children in school and at home | Portland State College, Oregon | 1960–61 | 72 |
| BR5-1120 | Comparative study of current educational programs for pre-school children. | Oregon State System of Higher Education | 1966–67 | 64 |
| BECKER, Samuel L.<br>A-739 | Relationships of interest and attention to retention and attitude change. | University of Iowa | 1961–63 | 8 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| BELFORTE, John<br>BR5-1082 | Exploring ways to integrate audiovisual media with elementary school instructional practices. | Jefferson Elementary School District, California | 1966 | 9 |
| BENNETT, Ann<br>BR5-1377 | To index research projects suitable for making up tormatrix search cards. | Self | 1965–66 | .28 |
| BERGER, Emanuel<br>BR5-0683 | Assessment of three foreign language strategies utilizing three language laboratory systems. | Pennsylvania Department of Public Instruction Harrisburg, Pennsylvania | 1965–67 | 161 |
| BERN, H. A.<br>BR5-0861 | Improving the quality of teacher performance by use of the video tape recorder. | Indiana University | 1959–61 | 66 |
| BIDDLE, Bruce J.<br>BR5-0627 | Impact of media on the school as an institution. | University of Missouri | 1962–63 | 154 |
| BR5-0892 | Essays on the social systems of education. | University of Missouri | 1962–63 | 40 |
| BIRCH, Jack W.<br>A-773 | The development and evaluation of programmed instruction in language for children with auditory disorders. | University of Pittsburgh | 1961–62 | 12 |
| (E. Ross Stuckless)<br>A-978 | Programmed instruction and the correction of written language of adolescent deaf students. | University of Pittsburgh | 1962–63 | 18 |
| BLACK, Harvey B.<br>BR5-0871 | Relevant and irrelevant pictorial color cues in discrimination learning — manipulation stimuli practice procedures and intervals, shape discriminatability, test procedure and age of subject. | Indiana University | 1963–65 | 9 |
| A-688 | Improving the programming of complex pictorial materials. | Indiana University | 1961–62 | 3 |
| BR5-0878 | The effect of observation of pictorial stimuli on Transfer Tasks. | Indiana University | 1963–66 | 82 |
| BLACK, William A.<br>A-091 | The effectiveness of filmed science courses in public secondary schools. | Kansas State College Pittsburg, Kansas | 1959–60 | 82 |
| A-625 | Retention value of filmed science courses. | Kansas State College Pittsburg, Kansas | | |
| BLACKMAN, Leonard S.<br>A-368 | Development and evaluation of a curriculum for educable mental retardates utilizing self-instructor devices or teaching machines. | Edward Johnstone Research Center | 1960–63 | 176 |
| BLOCK, A. Harvey<br>BR5-8356 | Test of the use of a program of instruction in basic math requiring only minimal reading skills for use as a remedial tool for college freshman. | Morgan State College Baltimore, Maryland | 1966 | 9 |
| BOGUSLAVSKY, G. W.<br>BR5-0458 | Study of characteristics contributing to the effectiveness of visual demonstrations. | Rensselaer Polytechnic Institute | 1962–65 | 57 |
| BOND, Jack H.<br>BR5-0951 | Using simulation techniques to change attitudes of education majors toward professional course objectives. | Oregon State System of Higher Education | 1964–65 | 4 |
| BORGLUM, George P.<br>A-112 | Modern language audio-visual research. | Wayne State University | 1959–63 | 253 |
| BORNSTEIN, Harry<br>A-985 | Development of a filmed program for teaching the manual alphabet. | Gallaudet College | 1962–65 | 47 |
| BRIGGS, Leslie J.<br>A-683 | Role of teaching machine programs in achieving educational objectives. | American Institute for Research, Pittsburgh, Pennsylvania | 1961–62 | 88 |
| A-946 | Research in degree of student control over programmed instruction: Initial and cumulative effects of self-direction and self-evaluation of progress. | American Institute for Research, Pittsburgh, Pennsylvania | 1962–63 | 66 |
| A-1002 | Investigations of thinking via self-instructional programs. | American Institute for Research, Pittsburgh, Pennsylvania | 1963–64 | 42 |
| BR5-0760 | Increasing long-term retention of knowledge — methods of instruction for students of different ability levels. | American Institute for Research, Pittsburgh, Pennsylvania | 1963–65 | 96 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| BRYAN, Edward E.<br>A-447 | A comparative study in the teaching of high school chemistry and physics. | Oklahoma State Department of Education | 1960–61 | 16 |
| BUCH, John H.<br>(Edward Tracy)<br>A-759 | A comparison of four variations of language instruction in beginning French. | Easton, Pennsylvania High School System | 1961–63 | 31 |
| BUCHANAN, Cynthia D.<br>A-482 | Investigation of principles involved in adapting linguistic materials for use with automatic instructional media. | Hollins College | 1960–61 | 3 |
| BUCHHEIMER, Arnold<br>BR5-0870 | Videotapes and kinescopic recordings as situational test and lab exercises in empathy for the training for counselors. | City University of New York | 1962–64 | 98 |
| BURKHART, James A.<br>A-260 | Experiment to determine the values of using amplified classroom telephone interviews with significant individuals to enrich certain college courses. | Stephens College Columbia, Missouri | 1959–60 | 16 |
| BURRIS-MEYER, H.<br>BR5-0646 | Inquiry into the educational potential of non-verbal communications. | Florida Atlantic Ocean Science Institute | 1968–70 | 216 |
| BURROUGHS, Elaine L.<br>A-535 | Experiments with the applications of audiovisual and automatic devices to the teaching of French. | Hollins College | 1960–61 | 3 |
| CAMPBELL, Donald T.<br>BR5-0893 | Exploration of novel research designs and measurement techniques. | Northwestern University | 1962–64 | 77 |
| CAMPBELL, Vincent N.<br>(Leslie Briggs)<br>A-520 | Studies of bypassing as a way of adapting instruction programs to individual differences. | American Institute for Research and Behavioral Sciences | 1960–62 | 65 |
| BR5-0717 | Degree of student control over programmed instruction – long term cumulative effects on problem solving and transfer. | American Institute for Research and Behavioral Sciences | 1964–65 | 80 |
| CAMPEAU, Peggie L.<br>A-1155 | Level of anxiety and presence or absence of feedback in programmed instruction. | American Institute for Research and Behavioral Sciences | 1964–65 | 4 |
| CARPENTER, C. R.<br>C-1058 | Research report on operational plans for developing regional educational media research centers. | Pennsylvania State University | 1961–62 | 25 |
| A-567 | Comparative research on methods and media for presenting programmed courses in Math and English. | Pennsylvania State University | 1960–62 | 167 |
| CARTER, Lamore J.<br>A-272 | Comparative study of the effectiveness of three techniques of film utilization in teaching a selected group of educable mentally retarded children enrolled in public schools in Louisiana. | Grambling College Louisiana | 1959–60 | 21 |
| CARTER, Roy E.<br>A-891 | A field experimental study of the functions of educational TV. | University of Minnesota | 1962–64 | 44 |
| CASE, Harry W.<br>A-458 | Measurement and analysis of physiological response to film. | University of California | 1960–62 | 37 |
| A-635 | Basic properties of an automated teaching system. | University of California | 1961–63 | 100 |
| CATE, Charles A.<br>A-361 | Effectiveness of photographic media in the modification of children's classroom behavior and self concepts. | University of Florida | 1960–62 | 39 |
| CHANCE, Clayton W.<br>A-243 | Experimentation in the adaption of the overhead projector utilizing 200 transparencies and 800 overlays in teaching engineering descriptive geometry curricula. | University of Texas | 1959–60 | 11 |
| CHRISTENSEN, Peter B.<br>A-344 | Cinematographic method for teaching the concept of dental occlusion and articulation. | Loyola University | 1959–61 | 7 |
| CLINE, Marion, Jr.<br>A-198 | Improving language arts of bilinguals through audiovisual. | New Mexico Highlands University | 1959–62 | 22 |
| COBIN, Martin T.<br>A-448 | Development of new method to test the relative effectiveness of specific visual production techniques for instructional TV. | University of Illinois | 1960–61 | 11 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| COGSWELL, John F.<br>BR5-0738 | New solutions to implementing instructional media through construction of school simulation vehicle. | System Development Corporation<br>California | 1963–65 | 194 |
| COHEN, David B.<br>BR6-8670 | Study of the efficiency of learning when both incidental and intentional learning occur simultaneously. | St. Leo College | 1966–67 | 7 |
| COHEN, Jozef<br>BR5-0515 | Studies in Mnemonic Programming. | University of Illinois | 1965–66 | 8 |
| COOK, H. Robert<br>A-1018 | Effects on learning of structural drills in Spanish broadcast via high frequency AM radio. | Indiana University | 1963–64 | 4 |
| COONEY, Joan<br>BR8-0475 | Television for preschool children. | National Educational TV, New York | 1969 | 1,030 |
| COOPER, Theodore B.<br>A-280 | Exploratory investigation of perceptual reactions of southern undergraduate Negroes to visual material depicting various groupings of ethnic subjects. | Florida Agricultural and Mechanical University | 1959–60 | 12 |
| CRAMER, H. Leslie<br>BR5-0958 | Intelligibility of compressed speech. | Harvard University | 1965 | 9 |
| CROSBY, Gladys<br>A-391 | Development and evaluation of perceptual materials for an individualized approach in ninth grade algebra. | Queens College | 1959–62 | 34 |
| CURTIS, H. A.<br>(Kropp)<br>A-385 | Experimental analyses of the effects of various modes of item presentation on the scores and factorial content of tests administered by visual and audiovisual means – a program of studies basic to TV testing. | Florida State University | 1960–61 | 40 |
| DAWSON, Marvin<br>A-1020 | Role of context in learning pictorial materials. | Indiana University | 1963–64 | 2 |
| DAY, Willard F.<br>A-676 | Programming a teaching machine course in thinking and problem solving. | University of Nevada | 1960–62 | 2 |
| de SOLA POOL, Ithiel<br>A-083 | The out-of-classroom audience of WGBH a study of motivation in viewing. | Massachusetts Institute of Technology | 1959–61 | 80 |
| DETERLINE, William A.<br>BR7-1071 | Development of a programmed course for group instruction of secondary teachers and administrators in the techniques of instructional technology. | General Program Teaching<br>Palo Alto, California | 1967–68 | 84 |
| DEVAULT, M. Vere<br>A-419 | TV and consultant services as methods of inservice education for elementary school teachers of math. | University of Texas | 1960–61 | 72 |
| DEVITT, Joseph J.<br>A-032 | ID & evaluation on economical and practical method of proving intellectual stimulation to gifted pupils in small secondary schools through a TV instructional program. | Department of Education<br>State of Maine | 1959–62 | 227 |
| DIMLING, John A., Jr.<br>BR8-0479 | Identification and analysis of the alternative for achieving greater TV program diversity in the United States. | Spindletop Research Center<br>Lexington, Kentucky | 1968 | 38 |
| DOETKOTT, Richard<br>BR5-0823 | Development, testing and evaluation of a programmed method for the teaching of I.P.A. transcription. | Chapman College | 1965–66 | 9 |
| DOROUGH, C. Dwight<br>(Martin Shapiro)<br>A-551 | Automated instruction of remedial English. | University of Houston | 1960–63 | 50 |
| DREWS, Elizabeth M.<br>A-647 | The effectiveness of special training with AV in changing aspirations of intellectually superior students. | Michigan State University | 1961–63 | 116 |
| BR5-0610 | Effectiveness of audio-visuals in changing the aspirations of intellectually superior students. Phase II. | Michigan State University | 1963–65 | 49 |
| DRISCOLL, John P.<br>A-365 | The effects of mental retardation on film learning. | University of California | 1960–61 | 12 |
| DUROST, Walter N.<br>A-120 | Report on evaluation on "When is September?" | Pinellas City Public Instruction, Florida | 1959 | 27 |
| EDLING, Jack V.<br>(Walter Snyder)<br>A-221 | Study of the effectiveness of audiovisual teaching materials when prepared according to the principles of motivational research. | Oregon State System of Higher Education | 1959–63 | 60 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| EDLING, Jack V.<br>BR6-2454 | Experiments with education media designed to modify attitudes. | Oregon State System of Higher Education | 1966--68 | 36 |
| ENGAR, Keith M.<br>A-576 | Investigating TV distribution of visual aids on the University of Utah campus via low-power UHF. | University of Utah | 1960--62 | 50 |
| ENTWISLE, Doris R.<br>A-1012 | Four studies involving the use of programmed materials in engineering education. | Johns Hopkins University | 1962--63 | 5 |
| BR5-1370 | Teaching engineering design, a study of jobshop. | Johns Hopkins University | 1964--65 | 65 |
| EVANS, Richard I.<br>A-051 | The University Faculty and educational TV hostility, resistance, and change, a social psychological investigation in depth. | University of Houston | 1959--62 | 114 |
| FATTU, N. A.<br>BR5-0850 | Variations in instructional media, processes, content and aptitude variables in relation to efficiency of cognitive goal attainment. | Indiana University | 1962--64 | 112 |
| FELDMAN, Shirley (Deutsch, D. P.)<br>BR5-0737 | A study of the effectiveness of training for retarded readers in the auditory perceptual skills underlying reading. | New York Medical College New York | 1963--65 | 90 |
| FERSTER, C. B.<br>A-355 | The role of review material in continuous programming with teaching machines. | Indiana University | 1960 | 9 |
| FLANDERS, Ned A.<br>A-033 | Development & evaluation of sound filmstrips for improving teacher-pupil contacts in the classroom. | University of Michigan | 1959--62 | 53 |
| FLEMING, Malcolm<br>A-800 | Influence of three teaching machine factors — feedback to programmer, participation by the learner, and feedback to learner on the production and utilization of science films. | Indiana University | 1961--63 | 33 |
| BR5-0512 | Instructional illustrations — a survey of types occurring in print material for four subject areas. | Indiana University | 1965--66 | 28 |
| BR5-0447 | Message design, the temporal dimension of message structure. | Indiana University | 1965--67 | 19 |
| FOLLIS, Lee<br>A-269 | The use of closed circuit TV to improve teacher effectiveness. | Fontana School District, California | 1959--61 | 23 |
| FRAZIER, Alexander<br>A-298 | Testing the effectiveness of Two-Purpose TV programs in contributing to both teacher and pupil learning. | Ohio State University | 1959--60 | 35 |
| FRITZ, John O.<br>A-399 | The effect on instruction of the complementary use of audiovisual media with modified patterns in the use of the teaching staff. | University of Chicago | 1960--62 | 51 |
| FRYE, Charles H.<br>A-847 | Group versus individual pacing in programmed instruction. | Oregon State System of Higher Education | 1961--62 | 3 |
| FULTON, W. R. (Omer Rupiper)<br>A-192 | Selected vicarious experiences versus direct observational experiences of pre-service teacher in the foundation areas of professional preparation at the University of Oklahoma. | University of Oklahoma | 1950--61 | 75 |
| GAGNE, Robert M.<br>BR5-0425 | The relationship of visual presentations to individual differences and effective learning and retention. | American Institute for Research, Pittsburgh, Pennsylvania | 1953--65 | 60 |
| GAMES, Paul A.<br>A-863 | Student response to linear and branching sequences in conventional and programmed televised instruction. | University of Ohio | 1962--64 | 43 |
| GARRY, Ralph J.<br>A-031 | The integration of science teaching by TV into the elementary school program. | Boston University | 1959--60 | 83 |
| A-527 | An investigation of concept development in elementary school science teaching by TV. | Boston University | 1960--63 | 84 |
| A-428 | Modern language project of the Massachusetts council for public schools, teachers training division, summary of research on "parlons francais," year two. | Boston University | 1960--61 | 69 |
| GILBERT, William M.<br>BR5-0868 | An investigation of the importance of the personal relationship and associated factors in teaching machine procedures. | University of Illinois | 1962--64 | 50 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| GILMORE, Alden S.<br>BR5-0667 | Further development, comparison, and evaluation of programmed instruction for retarded children. | University of South Florida | 1965–67 | 108 |
| GLASGOW, M. W.<br>A-253 | A study of the relative effectiveness of selected approaches to the in-service education of teachers in the utilization of in-school radio and TV broadcasts. | University of Oklahoma | 1959–61 | 67 |
| GOLDEN, Ruth I.<br>A-559 | Effectiveness of instructional tapes for changing regional speech patterns. | Detroit Public Schools | 1960–62 | 30 |
| BR5-0386 | Effectiveness of instructional tapes for changing dialect patterns of urban primary school children. | Detroit Board of Education | 1965–67 | 72 |
| GORDON, John M.<br>BR5-0747 | The effectiveness of four variations of programmed science materials. | Michigan State University | 1966 | 7 |
| GORDON, Morton J.<br>A-425 | TV Education in elementary school speech improvement. | University of Hawaii | 1960–62 | 18 |
| GORDON, Oakley J.<br>(Keith Engar)<br>A-129 | Challenging the superior student by making the study of Russian available in the elementary school curriculum via TV. | University of Utah | 1959–63 | 106 |
| GOTTLIEB, David<br>BR5-0714 | The elementary school system in relation to teaching and learning methods. | Michigan State University | 1962–64 | 68 |
| GRANT, Theodore S.<br>A-064 | TV in health sciences education. | University of California | 1959–63 | 162 |
| GROPPER, George L.<br>A-336 | Stimulating pupil participation in the learning process by techniques of suspense anticipation, and competition in televised instruction. | Metropolitan Pittsburgh Educational TV Station | 1959–61 | 126 |
| A-637 | Instructional techniques for improving understanding of scientific principles through televised demonstrations. | Metropolitan Pittsburgh Educational TV Station | 1961–63 | 127 |
| A-872 | Evaluation of procedures for "individualizing" group instruction by television. | Metropolitan Pittsburgh Educational TV Station | 1962–64 | 105 |
| BR5-0445 | Programming visual presentations for procedural learning. | American Institute for Research, Pittsburgh, Pennsylvania | 1965–66 | 68 |
| BR5-0877 | Experimental evaluation of methods for improving conventional TV lessons. | Metropolitan Pittsburgh Educational TV Station | 1964–65 | 80 |
| BR5-0896 | Experimental investigation of visual representation in instruction. | Metropolitan Pittsburgh Educational TV Station | 1963–65 | 98 |
| GROW, Earl S.<br>BR6-8241 | Large screen TV involving student learning, space saving, and faculty acceptance. | Marquette University | 1966–67 | 8 |
| GUBA, Egon<br>(Willavene Wolf)<br>A-875 | Perception and TV — physiological factors in TV viewing. | Ohio State University | 1961–63 | 61 |
| BR5-0427 | A study of eye movement in TV viewing. | Ohio State University | 1964–68 | 167 |
| HALL, Keith A.<br>A-659 | Investigation of programming principles as applied to the production and utilization of filmstrips and filmstrip type materials in natural science. | Pennsylvania State University | 1961–64 | 30 |
| HANCOCK, John G.<br>A-1024 | Level of achievement, retention, and transfer of training in spelling as a function of mode of presentation. | Bucknell University | 1963 | 3 |
| HANSEN, Duncan<br>BR7-0071 | Research and implementation of collegiate instruction of physics via computer-assisted instruction. | Florida State University | 1966–68 | 237 |
| HANZELI, Victor<br>A-108 | Comparative evaluation of two modern methods for teaching a spoken language. | University of Washington | 1959–60 | 10 |
| HARDAWAY, Charles W.<br>A-988 | Study of attitudinal changes of teachers and pupils toward educational TV and an analysis of attitudes of various groups toward educational TV. | Indiana University | 1962–63 | 7 |

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|---|---|---|---|---|
| HARRIS, Charles O. A-261 | Development of problem solving ability and learning of relevant-irrelevant information through film and TV versions of a strength of materials testing laboratory. | Michigan State University | 1959–62 | 65 |
| HAYDEN, Jess BR5-0898 | Animated serial sections — a teaching aid for oral histology and embreology. | Loma Linda University | 1965–66 | 5 |
| HAYES, Robert B. BR6-2179 | Immediate learning reinforcement in a complex mental motor skill (driver training) using motion pictures. | Harrisburg School District, Pennsylvania | 1966–67 | 12 |
| HEAD, Sydney A-060 | Field experiment in the summertime use of open-circuit TV instruction to bridge the gap between high school and college. | Miami University | 1959–61 | 63 |
| HERRICK, Marlyn C. A-674 | The effect of problem-setting questions on rate and amount of learning in programming teaching machines. | Indiana University | 1961–62 | 2 |
| HICKEY, Albert A-899 | Requirements for graphic teaching machines. | Northeastern University | 1961–62 | 33 |
| HOBAN, Charles F. A-823 | Determinants of audience formation and reactions to early-morning TV college credit courses. | University of Pennsylvania | 1960–63 | 86 |
| BR5-0837 | Determinants of adult enrollment in televised college — credit courses, social characteristics and reactive behavior. | University of Pennsylvania | 1963–65 | 47 |
| HOFFMAN, Lee BR5-0750 | Learner-participation techniques in a programmed course on elementary government and civics via TV. | Tulane University | 1963–64 | 48 |
| HOWE, Harold S. A-259 | Development of animated films to facilitate creative space perception. | Rensselaer Polytechnic Institute | 1959–61 | 37 |
| HUGGINS, William H. BR6-2816 | Exploratory studies of two kinds of films of engineering education. | Johns Hopkins University | 1967–68 | 35 |
| HUNT, Lyman C. A-309 | Experimental project appraising the effectiveness of a program series on reading instruction using open-circuit television. | Pennsylvania State University | 1959–61 | 77 |
| HUNT, William A. A-1075 | The use of programmed instruction in introductory psychology for teachers. | Northwestern University | 1963–64 | 3 |
| IVEY, Sara A-278 | Study of closed-circuit TV as a teaching technique for speech improvement in the public school system. | University of Arkansas | 1958–60 | 21 |
| JACKSON, John R. A202 | Improvement of biology instruction through use of recorded lectures to increase contact between students and senior staff members. | Wayne State University | 1959–60 | 75 |
| JAFFE, Abram (Allen Barton) BR5-0739 | Studies in the utilization of TV in the schools: a further analysis of data collected for the NY State regents educational TV project. | Teachers College Columbia University | 1963–64 | 10 |
| JENSEN, Paul H. BR5-1121 | Self-evaluation in in-service teacher education. | Oregon State System of Higher Education | 1966–68 | 147 |
| JENKINS, Esther C. BR5-0886 | The efficacy of videotapes and direct observation for teaching observational skills. | University of Hawaii | 1964–65 | 10 |
| JOHNSON, Charles E. A-324 | Development of methods and materials to facilitate foreign language instruction in elementary schools. | University of Illinois | 1959–61 | 92 |
| A-710 | Development and evaluation of methods and materials to facilitate foreign language instruction in elementary schools. | University of Illinois | 1961–62 | 51 |
| JOHNSON, Donald W. BR5-0899 | Educational psychology by videotape for in-service teachers. | Pennsylvania State University | 1964–65 | 10 |
| JOHNSON, F. Craig A-374 | Investigation of motion picture film and the program analyzer feedback to improve TV teacher training. | University of Ohio | 1960–61 | 34 |
| JOHNSTON, Roland E. A-240 | Magnetic recordings and visual displays as aids in teaching introductory psychology to college students. | Drexel Institute Philadelphia, Pennsylvania | 1959–61 | 28 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| JOYCE, Bruce<br>BR5-1079 | Exploration of the utilization of personnel in the supervision of student teachers when educational media are employed. | Columbia University | 1966–67 | 10 |
| KAGAN, Norman<br>BR5-0887 | The interpersonal recall technique in the counseling process. | Michigan State University | 1963–65 | 120 |
| BR5-0880 | Interpersonal process recall technique. | Michigan State University | 1965–67 | 176 |
| KALLENBACH, W. Warren<br>BR6-1303 | Effectiveness of videotape practice teaching sessions in the preparation of elementary intern teachers. | San Jose State College California | 1966–67 | 69 |
| KARIS, Charles<br>BR5-0773 | The interactive effect of response per frame, response mode, and response confirmation on intraframe S-R association strength. | Northeastern University, Boston | 1965–67 | 35 |
| KARLSEN, Bjorn<br>BR5-0746 | Teaching beginning reading to hearing-impaired children, using a visual method and teaching machines. | University of Minnesota | 1964–66 | 71 |
| KEENAN, Thomas A.<br>BR8-0697 | The Educational Network. | EDUCOM | 1968–69 | 135 |
| KELLER, Robert J.<br>A-077 | Closed-circuit television in teacher education. | University of Minnesota | 1959–63 | 286 |
| KERSH, Bert Y.<br>A-907 | Directed discovery versus programmed instruction: A test of a theoretical position involving educational technology. | Oregon State System of Higher Education | 1962–64 | 15 |
| BR5-0848 | Classroom simulation — further studies on dimensions of realism. | Oregon State System of Higher Education | 1964–66 | 45 |
| A-886 | Classroom simulation — a new dimension in teacher education. | Oregon State System of Higher Education | 1962–63 | 17 |
| (Twelker)<br>BR5-0774 | Successive vs. simultaneous attainment of instructional objectives in classroom simulation. | Oregon State System of Higher Education | 1965–67 | 78 |
| KETCHAM, Carl H.<br>A-378 | Experiment to determine the effectiveness of motion pictures with sound in the teaching of materials which cannot be directly portrayed in visual images. | University of Arizona | 1960–63 | 11 |
| KINNIELL, W. T.<br>BR5-0351 | The testing and modification of overhead projection transparencies for special use with classes for the deaf. | Texas Educational Agency | 1965–67 | 75 |
| KLAUS, David J.<br>(Lumsdaine)<br>A-337 | Self-instructional supplements for a televised physics course, study plan and experimental design. | American Institute for Research in Behavioral Sciences | 1959–61 | 96 |
| BR5-0712 | Development and evaluation of procedures for using self-instructional media to develop student capability for independent thinking and judgment. | American Institute for Research in Behavioral Sciences | 1960–62 | 69 |
| KEISLAR, Evan R.<br>BR5-0511 | A "talking book" system of teaching beginning reading. | University of California | 1965 | 7 |
| KNOWLTON, James Q.<br>A-038 | Studies of patterns of influence in the school situation as they affect the use of AV materials. | Indiana University | 1959–62 | 42 |
| KNUDSON, James G.<br>BR6-2813 | An investigation of the feasibility of the use of telecture and electrowriter systems to teach graduate engineering courses at remote locations. | Oregon State University | 1967–69 | 26 |
| KOVACS, Arpad<br>BR5-0897 | An analysis of the effectiveness of closed-circuit TV on team teaching. | St. Johns University New York | 1965 | 10 |
| KRAUSER, Arthur<br>A-845 | Development of abstract thinking in children through programmed instruction. | University of Rochester New York | 1961–62 | 3 |
| KRESS, Gerard C.<br>BR5-1122 | Study of social facilities during programmed instruction. | American Institute for Research in Behavioral Sciences | 1966–67 | 30 |
| BR5-0722 | The effects of pacing on programmed learning under several administrative conditions. | American Institute for Research in Behavioral Sciences | 1966 | 41 |
| KRUMBOLTZ, John D.<br>BR5-0851 | Factors affecting the design of effective teaching machine programs. | Michigan State University | 1961–64 | 61 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| LEE, Allen<br>A-C-1097 | Need for and feasibility of regional educational media research organizations with a regional research improvement orientation. | Oregon State System of Higher Education | 1961–62 | 25 |
| LEMKE, Olga<br>A-491 | The effectiveness of TV in teaching guidance at the sixth grade level. | Portland School Department | 1960–61 | 3 |
| LEVENS, A. S.<br>A-686 | Teaching the fundamentals of orthogonal projection, a study in the film presentation of the thought model method. | University of California | 1961–63 | 11 |
| LEVIN, Gerald R.<br>A-538 | Principles of programming materials for teaching machines and their relation to transfer of training. | Brown University Providence, Rhode Island | 1960–61 | 3 |
| LEVINSON, Elias<br>A-445 | Effects of motion pictures on the response to narrative. | New York University | 1960–61 | 2 |
| LIVINGSTON, J. Sterling<br>BR8-0447 | Development of a multi-media course in economics for the U.S. Naval Academy. | Sterling Institute Washington, District of Columbia | 1968–69 | 241 |
| LOWELL, Edgar L.<br>A-023 | Experimental evaluation of AV methods-changing attitudes toward education. | John Tracy Clinic Los Angeles | 1959–63 | 163 |
| LUMSDAINE, A. A.<br>BR5-0844 | Automated instruction for procedural skills required by professional personnel. | University of California | 1961–63 | 35 |
| BR5-0883 | Study of cueing on request or on a delayed response in automated instruction. | University of California | 1961–62 | 2 |
| LYSRAND, William A.<br>BR8-0471 | International uses of media and cross-cultural comparisons. | American University | 1968–70 | 149 |
| Mc BEATH, Ronald J.<br>A-462 | A comparative study on the effectiveness of the filmstrip, sound filmstrip, and filmograph for teaching facts and concepts. | University of Southern California | 1960–61 | 3 |
| MacDOUGALL, Mary A.<br>BR6-1310 | Methods of presenting programmed science materials to fourth grade level pupils of varying ability and achievement. | University of Virginia | 1966–68 | 65 |
| McINTYRE, Charles J.<br>A-457 | Televised instruction in university residence halls with trained undergraduates as discussion leaders. | University of Illinois | 1960–64 | 141 |
| BR5-0841 | An application of the principles of programmed instruction to a televised course in college – economics. | University of Illinois | 1964–65 | 10 |
| McINTYRE, Kenneth<br>A-332 | Study to determine specific sources of resistance to the use of audiovisual materials by college and university teachers and the development of procedures for overcoming the barriers to optimum use. | University of North Carolina | 1959–61 | 92 |
| McKEEGAN, Hugh F.<br>(Richard P. Wynn)<br>A-939 | Assessment of a graduate level self-teaching based on a combination of programmed instruction and the case method. | Pittsburgh University Pennsylvania | 1962–63 | 3 |
| McLUHAN, Herbert M.<br>A-279 | Understanding Media. | National Association of Education Urbana, Illinois | 1959–60 | 35 |
| McNEIL, John D.<br>BR5-0503 | Auditory discrimination training in the development of word analysis skills. | University of California | 1965–67 | 39 |
| MacDONALD, Neil W.<br>BR5-0457 | Television drama preference choice. | University of Minnesota | 1964–65 | 7 |
| MACCOBY, Nathan<br>A-680 | Sound film recordings in improving classroom communications. | Stanford University | 1961–63 | 118 |
| MAHLER, Thomas W.<br>BR5-1107 | An evaluation of the communication media used in the adult liberal studies program: Phase I. | University of Georgia | 1959–61 | 13 |
| BR5-1106 | An evaluation of the communications media used in the adult liberal studies program: Phase II. | University of Georgia | 1961–63 | 30 |
| BR5-1105 | An evaluation of the communications media used in the adult liberal studies program: Phase III. | University of Georgia | 1963–64 | 23 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| MALLINSON, George G.<br>BR5-0758 | Programmed materials for the blind. | Western Michigan University | 1963–66 | 10 |
| MARTIN, Walter T.<br>A-109 | Oregon Educational Television Project | University of Oregon | 1959–63 | 177 |
| MARTINI, Harry R.<br>BR5-0558 | Development of filmstrip sequence photographs and sound reproduction of educational television presentations. | North Brandywine Junior High, Pennsylvania | 1965–66 | 10 |
| MARZOLLO, Frank<br>BR5-1119 | Methods of presenting programmed instructional materials by teaching machine and computer. | Michigan State University | 1966–67 | 32 |
| METCALF, Richard M.<br>BR5-0422 | Exploratory analysis of projection-standard variables (screen size, image size and image contrast) in terms of their effects on the speed and accuracy of discrimination. | University of New Hampshire | 1961–62 | 2 |
| MEYN, Constance F.<br>A-1023 | The effects of negative practice on the acquisition and retention of material in a self-instruction program of spelling. | Bucknell University | 1963 | 3 |
| MILLER, Thomas E.<br>BR5-1078 | Educational media in instructional systems development at the Ohio State University. | Ohio State University | 1965–67 | 10 |
| MILLER, William C.<br>BR5-0731 | The relationship of film movement and emotional involvement response and its effect on learning, etc. | University of Southern California | 1965–66 | 6 |
| MOAKLEY, Francis<br>BR5-0424 | The effects of relative sound increase and decrease in film mediated learning. | Indiana University | 1965–67 | 4 |
| MONOHAN, Patrick E.<br>BR5-0748 | Assimilation of new automated teaching methods into the school instructional repertoire. | Wisconsin Heights Joint District No. 1 | 1965 | 9 |
| MOORE, J. William<br>BR5-0757 | Development and evaluation of a programming technique for relating frame difficulty to the ability of the learner. | Bucknell University | 1963–65 | 40 |
| (Wendell Smith)<br>BR5-1381 | Motivational aspects of automated instruction. | Bucknell University | 1961–63 | 77 |
| MORRIS, James H.<br>A-107 | Television Junior College in Oregon. | Oregon State System of Higher Education | | |
| MORRISON, Arthur H.<br>BR5-0884 | Experimental study utilizing closed-circuit television in the teaching of dentistry. | New York University | 1959–61 | 155 |
| MYERS, Lawrence, Jr.<br>BR5-0869 | The identification of effective TV teachers. | Syracuse University | 1962–65 | 71 |
| A-161 | An experimental study of influence of the experienced teacher on TV. | Syracuse University | 1959–60 | 37 |
| NASCA, Donald<br>BR5-0718 | Effect of varied presentations of laboratory exercises within programmed materials on specific intellectual factors of science problem solving behavior. | State University of New York | 1964–65 | 19 |
| A-1017 | Effect of varied presentations of laboratory exercises within programmed materials on student ability to apply scientific principles to problem situations. | State University of New York | 1963–64 | 12 |
| NEIOT, Charles O.<br>BR5-1118 | The relationship of the new educational media to non-intellectual factors in learning. | Colorado State University | 1966–67 | 32 |
| A-C1000 | The relationship of new educational media to non-intellectual factors in learning. Literature review of research involving non-intellective factors in learning. | Colorado State University | 1962–63 | 33 |
| BR5-0827 | Use of videotaped instructional TV for teaching study skills in a university setting. | University of Colorado | 1965–66 | 10 |
| A-C1139 | The relationship of New Educational Media to non-intellective factors in learning Phase II. | Colorado State University | 1963–64 | 41 |
| NELSON, Carl B.<br>BR5-1084 | Effectiveness of the use of adjunct programmed analyses of musical works on students' perception of form. | State University of New York | 1966–67 | 33 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| OLIVER, G. E.<br>A-130 | Study of preservice teacher education in the use of media of mass communication for classroom instruction. | University of Georgia | 1959–62 | 47 |
| ORR, David B.<br>A-1056 | Factors associated with the rate of speech and learning. | American Institute for Research, Pittsburgh, Pennsylvania | 1963–65 | 54 |
| BR5-0801 | Further research on speeded speech as an educational medium. | American Institute for Research in Behavioral Sciences | 1965–67 | 144 |
| BR7-0642 | Time-compressed speech as an educational medium — studies of stimulus characteristics and individual differences. | American Institute for Research in Behavioral Sciences | 1967–69 | 101 |
| PAINE, Frank R.<br>A-375 | Student councils, investigation of their visual aids and utilization. | University of Mississippi | 1960 | 30 |
| PAINTER, William I.<br>A-127 | Production and use of classrooms on film versus traditional observations in teacher education. | University of Akron, Ohio | 1959–61 | 31 |
| PALMER, Edward<br>BR8-0520 | Development and validation of criteria for evaluating media training. | Oregon State System of Higher Education | 1968–69 | 108 |
| PARNES, Sidney J.<br>BR5-0716 | Programming creative behavior. | State University of New York | 1963–66 | 60 |
| PATRICK, Robert B.<br>A-217 | Measurement of the effectiveness of the documentary sound-film as a supplement in the teaching in the secondary schools. | Pennsylvania State University | 1959–62 | 67 |
| A-868 | Effectiveness of the documentary sound film as a supplement in secondary school teacher education — a followup of first year teacher performance. | Pennsylvania State University | 1962–63 | 27 |
| PAULSON, Casper F.<br>A-1083 | Slow learners, competition, and programmed instruction. | Oregon State System of Higher Education | 1963–64 | 4 |
| BR5-0952 | Relationship of two techniques for developing slide-tapes to their structure and effectiveness. | Oregon State System of Higher Education | 1964–65 | 5 |
| PEERSON, Nell<br>A-417 | Experiment with evaluation in the eradictation of adult illiteracy by use of TV instruction over a state education network supplemented by supervised group viewing. | Florence State College, Alabama | 1960–61 | 66 |
| PLUMPTON, Russel A.<br>BR5-0751 | Methods of determining pupil readiness for specific units of instruction presented through simulated environment media. | Board of Cooperative Education | 1963–64 | 4 |
| POLING, E. Gordon<br>A-1235 | Videotape recordings in counseling practicum. | University of South Dakota | 1964 | 10 |
| POPHAM, W. James<br>A-470 | Tape recorded lectures in the college classroom — an experimental appraisal. | San Francisco State College | 1960–61 | 3 |
| A-474 | Tape recorded lectures in the college classroom — an experimental appraisal. | Kansas State College of Pittsburg | 1960 | 2 |
| A-841 | The influence of novelty effect upon teaching machine learning. | San Francisco State College | 1961–62 | 3 |
| BR5-0201 | The use of videotapes in teacher education. | University of California | 1965–66 | 6 |
| PORTER, David H.<br>(Fred Bryon)<br>A-1090 | Immediate learning reinforcement in driver training through motion pictures. | Harrisburg, Pennsylvania | 1963–64 | 14 |
| BR5-0715 | Immediate learning reinforcement in a complex mental motor skill (driver training) using motion pictures. | Harrisburg, Pennsylvania | 1964–65 | 13 |
| POULOS, Chris G.<br>BR5-0720 | Team teaching in high school biology via closed-circuit television. | Wisconsin | 1964–66 | 8 |
| PRICE, George W.<br>BR5-0759 | Effect of paried associate learning of contour cues and reducing irrelevant cues in the pictorial stimuli. | Indiana University | 1964–66 | 4 |
| PRICE, James E.<br>A-670 | A comparison of automated teaching programs with conventional teaching methods as applied to teaching mentally retarded students. | Partlow State School, Alabama | 1961–62 | 3 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| RAMSEY, Curtis P.<br>A-492 | Research project for the development of a measure to assess attitudes regarding the uses of newer educational media. | George Peabody College, Tennessee | 1960–61 | 5 |
| RANDALL, Earle S.<br>A-316 | Foreign languages in elementary schools, television and film project — teacher training division. | Massachusetts Council for Public Schools | 1959–60 | 57 |
| RICH, Owen S.<br>BR5-0843 | Utilization of large-screen TV to overcome shortages of classroom space and teaching personnel. | Brigham Young University | 1965–66 | 10 |
| RICHARD, Scott T.<br>BR5-8351 | Application of audiovisual materials and simulation to modify the Harvard case study method for preparing student personnel administrators. | Indiana University | 1966 | 9 |
| RICHARDSON, John S.<br>A-177 | Development of a mobile laboratory for in-service education of teachers of science and mathematics. | Ohio State University | 1959–61 | 90 |
| RIPPLE, Richard<br>BR5-0567 | Relationship of anxiety creativity and intelligence to programmed learning. | Cornell University | 1965–66 | 8 |
| ROGERS, William R.<br>A-093 | TV utilization in the observation program for teacher education. | San Jose State College | 1959–62 | 203 |
| ROSEN, Mervin J.<br>BR5-8332 | Experimental design for comparing the effects of instructional media programming procedures. | American Institute for Research in Behavioral Sciences | 1966–67 | 9 |
| ROWLETT, John D.<br>A-629 | Experimental comparison of direct detailed discovery methods of presenting tape-recorded instruction. | Eastern Kentucky State College | 1960–61 | 1 |
| ROY, Rob<br>BR5-1081 | Computer aided instruction for a course in Boolean algebra and logic design. | Rensselaer Polytechnic Institute | 1966–67 | 9 |
| RUST, Gosvenor C.<br>BR5-0845 | Effectiveness of color photographs in programmed instruction. | Southern Illinois University | 1961–63 | 3 |
| SALTZMAN, Irving J.<br>A-658 | Construction and evaluation of a self instructional program in Russian. | Indiana University | 1961–63 | 87 |
| SANDEFUR, J. T.<br>BR5-1009 | Observation and demonstration in teacher education by closed-circuit TV and videotape recordings. | Kansas State Teachers College | 1966–67 | 10 |
| SARGEANT, Leslie W.<br>A-515 | Comparison of the short-term effects of certain types of TV program materials. | Pacific Union College | 1960–61 | 2 |
| SAUL, Ezra<br>A-694 | Effect of selected spatial design factors in educational displays on learning and retention. | Tufts University | 1961–62 | 3 |
| SCHALOCK, Henry D.<br>A-971 | Motion pictures as test stimuli — an application of new media to the prediction of complex behavior. | Oregon State Systems of Higher Education | 1962–64 | 54 |
| SCHLESINGER, Lawrence E.<br>A-1027 | Effect of relevant emotional content on performance and learning in programmed instruction. | George Washington University | 1963–65 | 39 |
| SCHRAMM/OBERHOLTZER<br>A-354 | Denver-Stanford Project: Four years of research on the context of ITV. | Denver-Stanford | 1960–64 | 321 |
| SCHUELER, Herbert<br>A-068 | Improvement of student teaching — use of TV for improving teacher training and for improving measures of student teaching performance. | City University of New York | 1959–63 | 161 |
| SCHURE, Alexander<br>BR8-0446 | Development of a multi-media course in physics in the U.S. Naval Academy. | New York Institute of Technology | 1968 | 376 |
| SCHUTZ, Richard<br>BR5-0459 | Measurement procedures in programmed instruction. | State University of Arkansas | 1962–64 | 49 |
| BR5-0740 | Reinforcement schedules in pacing reading rate and adjusting reading behavior. | State University of Arkansas | 1964–66 | 28 |
| BR5-0894 | Synchronized filmstrips and tape recordings to stimulate observation in educational psychology. | State University of Arkansas | 1964–65 | 10 |
| SCHWARZWALDER, John<br>A-085 | An investigation of the relative effectiveness of certain specific TV techniques on learning. | Twin City Educational TV Corporation | 1959–60 | 50 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| SCREVEN, C. G.<br>BR7-0138 | Application of programmed learning and teaching systems procedures for instruction in museum environment. | University of Wisconsin | 1967–69 | 142 |
| SEIBERT, Warren<br>BR5-0431 | Correlational analysis of the effects of learner and linear program characteristics. | Purdue University | 1965–67 | 45 |
| BR5-0846 | A study of motion pictures in educational and psychological testing. | Purdue University | 1962–63 | 51 |
| BR5-0815 | Studies in cine-psychometry, factor analysis of audiovisual memory. | Purdue University | 1965–67 | 86 |
| SHELL, William B.<br>BR6-8294 | The differential effect of interim testing in the use of an auto-instructional program in an area of general science for teachers. | Auburn University | 1966–67 | 9 |
| SHEMICK, John M.<br>A-1157 | Study of the relative effectiveness of teaching a manipulative skill – a multi-media teaching program versus classroom demonstration with printed instruction sheets. | Pennsylvania State University | 1963–64 | 4 |
| SHORT, J. G.<br>BR5-0721 | An experimental study of sequencing strategies. | American Institute for Research Pennsylvania | 1965–66 | 29 |
| SIEGEL, Laurence<br>BR5-0852 | Study of the instructional gestalt in university courses presented by TV. | Miami University | 1960–64 | 139 |
| SILBERMAN, Harry<br>A-968 | Individual tutoring techniques for the development of programming methods and theory. | System Development Corporation, California | 1962–64 | 105 |
| (John Coulson)<br>BR5-0719 | Non-program variables in the application of programmed instruction. | System Development Corporation, California | 1964–65 | 79 |
| (John Coulson)<br>A-671 | Development and evaluation of self-instructional materials for under-achieving and over-achieving students. | System Development Corporation, California | 1961–62 | 88 |
| SKINNER, B. F.<br>A-191 | An analysis of the behavioral processes involved in self-instruction with teaching machines. | Harvard University | 1960–63 | 250 |
| SMITH, Hope<br>A-486 | Viewing of oneself performing selected motor skills in motion pictures and its effect upon the expressed concept of self in movement. | University of California | 1960–61 | 1 |
| SMITH, M. Daniel<br>BR5-0888 | Non-wordal programming: a study of selected variables. | Earlham College | 1964–65 | 12 |
| BR5-0872 | An exploration of non-wordal programming in mathematics and science. | Earlham College | 1962–63 | 19 |
| SMITH, Martin E.<br>(Warren Seibert)<br>BR5-0954 | Prediction of effects with selected characteristics of linear programmed instruction. | Purdue University | 1965 | 8 |
| SMITH, Philip D.<br>A-719 | Knowledge of results and continuity of various techniques in presenting a filmstrip as factors in immediate learning and retention. | Bob Jones University Greenville, South Carolina | 1961–63 | 3 |
| SMITH, Wendell I.<br>A-489 | Programmed materials in mathematics for superior students in rural areas. | Bucknell University | 1960–62 | 58 |
| (J. William Moore)<br>A-485 | Size-of-step and achievement in programmed spelling. | Bucknell University | 1960–61 | 2 |
| BR5-0838 | Learning sets in programmed instruction. | Bucknell University | 1963–65 | 37 |
| SNOW, Richard E.<br>A-732 | Importance of selected audience and film characteristics as determiners of the effectiveness of instructional films. | Purdue University | 1961–62 | 3 |
| BR5-0847 | Factor-analytic study of instructional film learning. | Purdue University | 1963–65 | 18 |
| SOWELL, Ketye<br>BR5-0757 | Effect of an aural increment in auto-instructional mathematical material for college students. | Florida State University | 1965–66 | 5 |
| SPENCER, William A.<br>A-074 | Teaching human psychology via a multi-channel data broadcasting system. | Baylor Medical College | 1959–62 | 60 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| SPOHN, Charles L.<br>A-876 | Evaluation of two methods using magnetic tape recordings for programmed instruction in the elemental materials of music. | State University of Ohio | 1962–63 | 57 |
| BR6-0840 | Comparison between different stimuli combined with two methods for providing knowledge of results in music instruction. | State University of Ohio | 1963–66 | 87 |
| STAKE, Robert E.<br>A-753 | Activity level and learning effectiveness. | University of Nebraska | 1961–63 | 16 |
| STARKWEATHER, J. A.<br>BR5-0652 | Computer science instruction in elementary grades. | University of California | 1966–67 | 76 |
| STREVELL, Wallace H.<br>A-306 | High school physics by TV – the Houston area project. | University of Houston | 1959–60 | 59 |
| STOLUROW, Lawrence<br>BR5-0456 | Psychological and educational factors in transfer of training. Learning how to learn several cue conditions. | University of Illinois | 1962–64 | 71 |
| BR5-0230 | Psychological and educational factors in transfer of training – bibliography of studies of transfer of training. | University of Illinois | 1964–66 | 149 |
| BR5-0452 | Comparative studies of principles for programming mathematics in automated instruction. | University of Illinois | 1961–64 | 181 |
| STROTHER, G. B.<br>BR5-0842 | Educational applications of management games. | University of Wisconsin | 1965–66 | 85 |
| SUCHMAN, J. Richard<br>A-216 | The elementary school training program in scientific inquiry. | University of Illinois | 1959–61 | 79 |
| SULLIVAN, Howard J.<br>BR5-0744 | The effects of selected film and counseling experiences on capable girls' attitudes toward college. | Oregon State System of Higher Education | 1963–64 | 5 |
| SUPPES, Patrick<br>BR5-0679 | Development of mathematical concepts in children. | Stanford University | 1967 | 46 |
| TEAHAN, John<br>BR5-0785 | Some effects of audiovisual techniques on aspirational level and ethocentric shift. | University of Wisconsin | 1965–67 | 120 |
| TENOAM, D. J.<br>A-132 | Preparation and evaluation in use of a series of brief films of selected demonstrations from the introductory college physics course. | Purdue University | 1959–61 | 71 |
| TICKTON, Sidney G.<br>BR8-0235 | Study of the use of new instructional media, with special attention to educational television. | Academy for Educational Development | 1968 | 15 |
| TIEDMAN, David<br>BR6-1819 | Information systems for vocational decisions. | Harvard University | 1955–69 | 415 |
| TIEMENS, Robert K.<br>A-459 | Comparative effectiveness of sound motion pictures and printed communications for the motivation of high school students in math. | University of Iowa | 1960–61 | 3 |
| BR5-0849 | Analysis of the application of instructional media to a basic university speech course. | Wayne State University | 1964–65 | 10 |
| TINTERA, James B.<br>A-008E | Analysis of methods in which application of new communications media may improve teacher preparation in Language, Science and Math. | Michigan State University | 1959–63 | 109 |
| TOBIAS, Sigmund<br>BR6-2380 | Response mode to programmed material and associative creativity. | City University of New York | 1967–68 | 29 |
| TOFFEL, George M.<br>A-302A | Effectiveness of instruction by TV in teaching high school chemistry in Alabama schools. | University of Alabama | 1959–60 | 8 |
| TORKELSON, G. M.<br>A-079 | An experimental study of patterns for improving the preparation of pre-service teachers in the use of audiovisual materials and of effects on pupils. | Pennsylvania State University | 1959–63 | 166 |
| TORRANCE, E. Paul<br>A-880 | Development and evaluation of recorded programmed experiences in creative thinking in the fourth grade. | University of Minnesota | 1961–64 | 55 |
| TOSTI, Donald T.<br>BR8-0448 | Development of multi-media course in leadership for the U.S. Naval Academy. | Westinghouse Learning Corporation, New York | 1968–69 | 400 |
| TRAVERS, Robert M. W.<br>BR5-0456 | Research and theory related to audiovisual information transmission. | University of Utah | 1962–65 | 92 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| TWELKER, Paul A.<br>BR5-0950 | Prompting as an instructional variable in classroom simulation. | Oregon State System of Higher Education | 1965--66 | 9 |
| BR5-1117 | Interaction analysis and classroom simulation as adjunct instruction in teacher education. | Oregon State System of Higher Education | 1966--67 | 42 |
| TWYFORD, L.<br>A-283 | New media for improvement in math and science instruction. | State University of New York | 1959--63 | 101 |
| VANDERMEER, A. W.<br>A-224 | Investigation of the improvement of educational filmstrips and a derivation of principles relating to the effectiveness of these media. | Pennsylvania State University | 1959--63 | 28 |
| A-225 | Investigation of the improvement of educational motion pictures and a derivation of principles relating to the effectiveness of these media. | Pennsylvania State University | 1959--63 | 36 |
| VAN HORN, Charles<br>BR5-0713 | Investigation of the applicability of motion pictures to educational testing. | University of Illinois | 1960--62 | 3 |
| VLCEK, Charles W.<br>BR5-0959 | Assessing the effect and transfer value of a classroom simulator technique. | Michigan State University | 1965 | 8 |
| VUKE, George J.<br>A-667 | Effects of inserted questions in films on developing an understanding of controlled experimentation. | Indiana University | 1961--62 | 2 |
| WENDT, Paul R.<br>A-396 | Study to determine the extent to which instruction to university freshman in the use of the university library can be turned over to teaching machines. | Southern Illinois University | 1959--63 | 57 |
| BR5-0873 | To test refinements in intrinsic programming in pictorial, audio, and performance frames to maximize the probability of desired terminal behavior. | Southern Illinois University | 1962--65 | 31 |
| WICKLINE, Lee E.<br>A-279 | The use of motivational films to favorably change the attitudes of high school students toward science and scientists. | West Virginia State Department of Education | 1961--62 | 1 |
| WIGREN, Harold E.<br>BR6-2026 | Survey of in-school closed-circuit TV and instructional TV fixed services. | National Educational Association Washington, District of Columbia | 1966--67 | 14 |
| WILDS, Preston L.<br>BR5-0839 | Effectiveness of a programmed text in teaching gynecological oncology to junior medical students. | Medical College of Georgia | 1963--65 | 117 |
| WILLIAMS, Deloss E.<br>A-471 | The role of sponsored motion pictures in the high school. | University of Southern California | 1960--61 | 1 |
| WITTICH, Walter A.<br>A-015 | Evaluation of ways of training teachers to improve day-to-day classroom learning activities through uses of AV media. | University of Wisconsin | 1959--61 | 85 |
| WITTROCK, M. C.<br>A-1107 | The effects of verbal cues on transfer of training. | University of California | 1963--64 | 9 |
| WODTKE, Kenneth H.<br>BR5-8334 | Random versus ordered sequencing in computer-assisted instruction. | Pennsylvania State University. | 1966--67 | 8 |
| WOLGAMUTH, Dale<br>A-453 | Comparative study of three techniques of student feedback in TV teaching -- the effectiveness of an electrical signal feedback. | American University | 1960--61 | 11 |
| WOOD, C. David<br>BR5-0745 | Comprehension of compressed speech by elementary school children. | Indiana University | 1965 | 5 |
| WOOLSEY, Frank M.<br>BR5-0876 | The use of two-way radio in graduate medical education. | Union University | 1964--65 | 136 |
| BR6-2745 | Development, utilization and evaluation of graduate education by two-way radio active participation conferences. | Albany Medical College | 1966 | 71 |
| WEDBERG, Desmond P.<br>A-685 | Comparative investigation of the instructional and administrative efficiency of various observational techniques in the introductory course in education. | University of Southern California | 1961--62 | 3 |
| YOSHIMO, Roger (J. W. Perry)<br>A-914 | Study of the effects of automated information retrieval on university students. | University of Arizona | 1962--64 | 56 |

# NDEA TITLE VII PROJECTS PART B

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| ALLEN, James<br>BR5-0228 | The Cue Report. | State Education Department New York | 1963–64 | 159 |
| ALLEN, William H.<br>B-136 | Analysis of research being conducted under Title VII, of the National Defense Education Act and preparation of related visuals. | Pasadena, California | 1960 | 1 |
| B-236a | Preparation of a course of study for the research information theory portion of a course in educational media research. | University of Southern California | 1963–65 | 16 |
| ANDERSON, James A.<br>BR5-8471 | Equivalence of meaning among similar statements presented in print, oral and pictorial media. | Wisconsin State University | 1967 | 5 |
| ARNEST, Phillip G.<br>BR5-1357 | Film clip pavilion, Washington, D. C. creative arts studio inc. | Creative Arts Studio, Washington, District of Columbia | 1964 | 14 |
| BARSON, John<br>BR5-0990 | A procedural and cost analysis study of media in instructional systems development. | Michigan State University | 1965 | 211 |
| BR5-1411 | Instructional systems development — a demonstration and evaluation project. | Michigan State University | 1965–67 | 268 |
| BAUER, Eric W.<br>BR5-0423 | Exploratory investigation of sensory image types in foreign language learning. | Indiana University | | .3 |
| BECK, Lester<br>B-262 | Interinstitutional teaching by TV in the Oregon State System of Higher Education. | Oregon State System of Higher Education | 1962 | 29 |
| BR5-0711 | Educational media (TV) for the preschool child. | Oregon State System of Higher Education | 1965 | 11 |
| BR5-0285 | Media, creativity and change. | Oregon State System of Higher Education | 1966 | 5 |
| BIDDLE, Bruce J.<br>BR5-1343 | The impact of new media on education and the society. | University of Chicago | 1962–64 | 19 |
| BIGGY, Virginia<br>BR5-1192 | Northeast regional instructional TV library project. | Eastern Education Network Massachusetts | 1961–62 | 234 |
| BR5-0266 | The identification, coordinated exchange and distribution of quality instructional TV programming in the northeast region. | Eastern Education Network Massachusetts | 1965–66 | 121 |
| BILINSKI, John<br>BR7-9006 | A cost study of educational media systems and their equipment components. | General Learning Corporation Washington, District of Columbia | 1967 | 82 |
| BIXBY, Paul W.<br>B-374 | Campus school to a research and dissemination center. | Pennsylvania State University | 1965 | 62 |
| BLACKMAN, Leonard<br>BR5-1342 | Demonstration film on the use of self-instructional devices in a curriculum for educable mental retardates. | Johnstone Center Bordentown, New Jersey | 1963–64 | 33 |
| BLOCK, A. Harvey<br>B-285 | Programmed instruction and teaching machines — a national demonstration exhibit. | Columbia University | 1962–63 | 295 |
| BLOODWORTH, Mickey<br>BR6-2536 | Plan for the systematic and continual identification of schools in the U.S. making significant use of educational media in their instructional programs. | National Association of Education, Washington, District of Columbia | 1966–67 | 111 |
| BR5-0299 | A plan for the systematic and continual identification of schools making significant use of newer media. | Department of Audio-Visual Instruction, National Education Association | 1965–66 | 27 |
| BOBONIS, Augusto<br>B-074 | Television for teachers in service. | University of Puerto Rico | 1960–61 | 14 |
| BOECKLEN, Warren<br>BR6-1519 | A computer study of the allocation of channels and placement of transmitters for 2500 megacycle fixed-station service in a metropolitan area containing many eligible applicants for licensing. | Audio-Visual Corporation of St. Louis | 1966–67 | 32 |
| BONDRA, George<br>BR5-1197 | Procedures for creating a media environment to help change teacher role from disseminating to guiding independent learners. | Mount Kisco New York | 1965–67 | 181 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| BOWEN, William<br>BR5-0987 | A regional project to assist the planning and development of inter-institutional use of recorded materials and new media. | Southern Regional Education Board, Atlanta | 1963–65 | 159 |
| BRIGGS, Leslie J.<br>BR7-1070 | Sequencing of instruction in relation to hierarchies of competencies. | American Institute for Research in Behavioral Sciences | 1967 | 15 |
| BR5-1354 | Development of motion picture films to disseminate information on teacher roles in classroom use of programmed instruction. | American Institute for Research in Behavioral Sciences | 1963–64 | 143 |
| BR5-0291 | Instructional media – procedure for the design of multimedia instruction, a critical review of research, and suggestions for future research. | American Institute for Research in Behavioral Sciences | 1965 | 26 |
| BRONSON, Vernon<br>B-160 | The needs of education for television channel allocations. | National Association of Education Broadcasters | 1961–62 | 66 |
| BR5-1347 | Standards of TV transmission, factors affecting microwave relay and closed-circuit transmission of educational materials. | National Association for Educational Broadcasters | 1962 | 216 |
| B-196 | Developing human resources for educational TV, reporting of a survey of personnel in educational TV. | National Association for Educational Broadcasters | 1962–63 | 48 |
| BROWN, James W.<br>BR5-0270 | Educational media institute evaluation report. | National Association for Educational Broadcasters | 1965–67 | 143 |
| BROWN, Louis<br>BR5-1157 | Determine the feasibility of developing two coordinated distribution systems for audiotape recorded materials. | University of Colorado | 1966–67 | 35 |
| BROWNE, Duff<br>BR5-0267 | Investigation, development and dissemination of procedures and techniques helpful to interinstitutional use of TV and related media. | Education Board Atlanta, Georgia | 1965–67 | 302 |
| BRUGGER, John R.<br>B-004 | Survey of television equipment and facilities used for purposes of instruction by public schools, colleges, and universities. | Washington City Education Board Maryland | 1959–60 | 22 |
| BUSHNELL, Don D.<br>BR5-1129 | The computer: a new media for the improvement of instruction. | Brooks Foundation, California | 1966 | 11 |
| BUSWELL, Guy T.<br>B-258 | Identification of needed research on the relationship of newer educational media to fundamental problems of teaching and learnings. | American Education Research Association Washington, District of Columbia | 1961–62 | 9 |
| BR5-1013 | Recommendations for reporting the effectiveness of programmed instruction materials. | American Education Research Association Washington, District of Columbia | 1961–65 | 33 |
| B-210 | Study formulation, and dissemination of technical information on auto-instructional programs, devices and research. | American Education Research Association Washington, District of Columbia | 1961–65 | 33 |
| CAMPION, Lee<br>OOCc | Fourth regional leadership conference to explore ways and means of disseminating information concerning new educational media. | National Education Association | 1960–61 | 18 |
| OOCd | Fifth regional leadership conference to explore ways and means of disseminating information concerning new educational media. | National Education Association | 1960–61 | 14 |
| OOCe | Sixth regional leadership conference to explore ways and means of disseminating information concerning new educational media. | National Education Association | 1960–61 | 21 |
| OOCf | Seventh regional leadership conference to explore ways and means of disseminating information concerning new educational media. | National Education Association | 1960–62 | 17 |
| BR5-0279 | Cooperative state leadership in educational communication. | Colorado State Department of Education | 1965–66 | 55 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| CARPENTER, C. R. BR7-1142 | Conditions and variables affecting the quality of instructional TV. | Pennsylvania State University | 1967–68 | 40 |
| B-159 | Bibliography of human communications with special reference to the new educational media. | Pennsylvania State University | 1960–61 | 2 |
| CARROLL, John B. BR7-1069 | Learning from verbal discourse in educational media. | Educational Testing Service | 1967–68 | 15 |
| COCHRAN, Lee W. B-264 | Work-study conference on new educational media for National University extension association. | University of Nebraska | 1961–62 | 8 |
| COGAN, Morris L. B-260 | Professional education of media service personnel preliminary edition. | University of Pittsburgh | 1963–64 | 29 |
| COHEN, Edwin G. B-035b | National instructional television demonstration. | National Educational TV & Radio Center | 1962–63 | 262 |
| B-035d | National instructional library demonstration. | National Educational TV & Radio Center | 1963–64 | 263 |
| CONNELLY, John W. B-106a | Findings and discussion on state laws dealing with the use of audiovisual instructional aids in the public elementary schools. | Washington, District of Columbia | 1961–62 | 29 |
| COX, Robert A. BR6-1431 | Director of summer session courses on educational media for 1966. | Educational Media Washington, District of Columbia | 1965–66 | 3 |
| BR6-1570 | Sources of information on educational media. | Educational Media Washington, District of Columbia | 1966–67 | 11 |
| CUTHBERTSON, Jack BR5-0993 | Study and plan for the use of media in the preparation of administrators. | University of Ohio | 1964–67 | 204 |
| CYPHER, Irene F. B-029 | A survey of the kinds of dissemination activities that hold the greatest promise for improving the use of new educational media in the public schools and institutions of higher education in New York State. | New York State Audio-Visual Council | 1960–61 | 27 |
| DAVIS, O. L. (Harold Wigren) B-OOCa | Second pilot regional leadership conference to explore ways and means of disseminating information concerning new educational media. | Phoenix, Arizona | 1959–60 | 19 |
| (Harold Wigren) B-OOCb | Third pilot regional leadership conference to explore ways and means of disseminating information concerning new educational media. | Norman, Oklahoma | 1960–61 | 18 |
| B-OCCg | Study of the impact of Office of Education regional leadership conferences. | Kent University | 1962 | 1 |
| DAY, James B-138 | Plan for educational TV in Hawaii. | Station KQED San Francisco, California | 1961–62 | 11 |
| DeBERNARDIS, Amo B-007 | Planning schools for new media. | Portland State College | 1959–61 | 31 |
| DE HAAN, Robert F. BR5-0988 | Use and development of programmed materials and media in private liberal arts colleges. | Great Lakes College | 1963–65 | 213 |
| De KIEFFER, Robert B-083 | Preplanning Title VII conference. | University of Colorado | 1959 | 2 |
| B-083a | Title VII research seminar, April 11-13, 1960, University of Colorado. | University of Colorado | 1960 | 20 |
| DETERLINE, William A. B-479 | Instructional programming procedures, a programmed course in the basic methods and techniques of preparing programmed instructional materials. | Texas | 1963 | 83 |
| DREWS, Elizabeth BR5-1349 | Summary information of film on the effectiveness of special training with audiovisuals in guidance and counseling. | Michigan State University | 1963–64 | 25 |
| DUKE, Benjamin C. B-134 | Survey of educational media research in the Far East: Instructional uses and research direction — new media for instruction. | International Christian University | 1960–62 | 28 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| DURSCHLAG, Stephen P.<br>BR7-0421 | Illinois Educational TV Project. | Illinois Television Communications Commission | 1967–69 | 17 |
| EBOCH, Sidney C.<br>BR5-0264 | Implementation of research strategies and tactics for demonstrations for newer media. | Ohio State University | 1966 | 91 |
| BR6-0296 | Planning and dissemination conference on novel strategies and tactics for field studies of new educational media demonstrations. | Ohio State University | 1966 | 23 |
| ELY, Donald P.<br>B-418 | Survey of educational media research and programs in Latin America. | Syracuse University | 1966 | 4 |
| ENGAR, Keith M.<br>BR6-0301 | Utah survey on educational TV. | University of Utah | 1964 | 24 |
| EVANS, Richard I.<br>BR6-0992 | University faculty and innovation — theory, a research case history (TV) implications. A social psychological analysis in depth. | Houston Research Institute | 1965 | 26 |
| FELLOWS, James A.<br>B-460 | Educational communications system. | National Association of Educational Broadcasters | 1965 | 76 |
| FINN, James D.<br>B-069 | A study of the impact of present and predicted technological developments on education. | National Education Association Washington, District of Columbia | 1960 | 4 |
| B-069a | A planning conference for a study of the impact of present and predicted technological developments on education. | National Education Association Washington, District of Columbia | 1960 | 2 |
| B-069b | Technological development and the teaching profession (with particular reference to the New Educational Media). | National Education Association Washington, District of Columbia | 1960–63 | 212 |
| BR5-0292 | Instructional technology and media project. | University of Southern California | 1963–65 | 339 |
| FLETCHER, Scott<br>BR5-1200 | Study on the long-range financing of educational TV stations. | National Association of Educational Broadcasters | 1964–65 | 50 |
| BR7-0738 | Study to analyze and evaluate various new ETV proposals in coordination with the second national conference on the long-range financing of educational TV stations. | National Association of Educational Broadcasters | 1967 | 26 |
| FLORY, John<br>B-045 | A survey of the needs for and developments in audiovisual devices suitable for educational use. | Society for Motion Pictures and TV Engineers | 1960–63 | 24 |
| FOLEY, Walter J.<br>BR6-1502 | Educational information project. | University of Iowa | 1965–67 | 124 |
| FORSDALE, Louis<br>BR5-0297 | Production of a motion picture and accompanying manual about the emerging role of 8 mm film in education. | Columbia University | 1964–66 | 33 |
| FOSTER, J. Edwin<br>B-156 | Five publications for the dissemination of information about the new educational media. | Educational Media Council, Incorporated New York | 1961 | 4 |
| B-166a | Preparation of two manuscripts of publications for the dissemination of information about the new educational media. | Educational Media Council, Incorporated New York | 1962 | 4 |
| BR6-1341 | Series of study projects to assist in the development of national guidelines in the educational media field. | Educational Media Council, Incorporated New York | 1961–63 | 177 |
| B-157 | National directory service for new educational media materials. | Educational Media Council, Incorporated New York | 1961 | 18 |
| BR5-1199 | Pilot national directory and subdirectories for new educational media materials. | Educational Media Council, Incorporated New York | 1961–64 | 513 |
| FULTON, W. R.<br>BR6-304 | Self-evaluative checklist and criteria for evaluating educational programs. | University of Oklahoma | 1966 | 38 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| GARRY, Ralph BR5-1345 | Economics of educational TV, a report on the national conference held at Brandeis University, Massachusetts. | Brandeis University | 1962–63 | 3 |
| GEMMELL, James BR5-0706 | Programmed instruction for superior students in small high schools. | Clarion State College, Pennsylvania | 1963 | 136 |
| GERARD, R. W. BR5-0997 | Computers and universities. A workshop conference presented by the University of California, Irvine, with the cooperation of the University of Michigan, Newport Beach, 1965. | University of California | 1965 | 21 |
| GERLACH, Vernon BR5-0269 | Producing the 8mm self-instructional film, a demonstration kit. | Arizona State University | 1965–67 | 41 |
| GLASER, Robert BR5-0253 | Learning research and development center. | University of Pittsburgh | 1964–68 | 400 |
| BR5-1355 | Interface between student and subject matter. | University of Pittsburgh | 1963–64 | 43 |
| GLIESSMAN, David BR5-1195 | Inter-university film project-developing titles, plan of utilization, and plan of evaluation for a series of problem-centered open-ended films to be used in teacher training. | University of Missouri | 1964–66 | 18 |
| BR5-0996 | Inter-university film project — the production of five stimulus films to be used in teacher training. | University of Missouri Kansas City | 1965–66 | 94 |
| GODFREY, Eleanor P. B-081 | Audiovisual equipment and materials in public schools and factors influencing their use. | Bureau of Social Science Research Washington, District of Columbia | 1960–61 | 160 |
| B-081a | Factors associated with use of audiovisual media vs. teachers in elementary and secondary schools. | Bureau of Social Science Research Washington, District of Columbia | 1963–64 | 143 |
| GOLDSTEIN, Harold B-269 | National conference on the implications of the new media for the teaching of library science. | University of Illinois | 1963 | 31 |
| GOLDWYN, A. J. BR5-0287 | An operating test of a pilot educational media research information center. | Western Reserve University, Ohio | 1963–65 | 143 |
| BR5-1185 | Preparation of a thesaurus of educational terms. | Western Reserve University, Ohio | 1966 | 51 |
| GREEN, Allan C. BR5-1193 | Planning and design of facilities to house the current trends in instructional methods and technologies. | Renssefaer Polytechnic Institute | 1963–64 | 95 |
| GREEN, Leroy A. BR5-0280 | Educational technology dissemination project; a project in selected methods of disseminating information regarding educational media by state departments of education. | Colorado State Department of Education | 1966 | 61 |
| GREENHILL, L. P. B-229 | Documentary motion picture report on the Pennsylvania State University System of televised instruction. | Pennsylvania State University | 1962–63 | 21 |
| GROSSMAN, Alvin BR5-0308 | Development of an educational information retrieval system for the State of California. | California State Department | 1965–67 | 209 |
| GUNN, Hartford N. B-237 | Demonstration for the use of FM radio networks to facilitate the conference technique of communication among institutions of higher education. | WGBH Educational Foundation | 1961–62 | 39 |
| GUSS, Carolyn (Margaret Rufsvold) B-OOE | A study to determine a feasible method of establishing bibliographic control of educational audiovisual materials for the purpose of informing teachers concerning available materials and their educational utility. | Indiana University | 1959 | 5 |
| (Margaret Rufsvold) B-OOEa | A conference on implementing a system for national bibliographic control of the newer educational media. | Indiana University | 1960–61 | 15 |
| HALL, Robert O. B-208 | Content and pattern for the professional training, AV communication specialists. | California State College at Hayward | 1962–63 | 34 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| HAMILL, Patricia<br>B-56 | Directory of college courses in radio and TV in school year 1957–58. | American University | 1957–58 | 5 |
| B-154 | Directory of college courses in radio and TV in school year 1961–62. | American University | 1962–63 | 5 |
| HANSON, Lincoln F.<br>B-232a | Programs, a guide to programmed instruction materials available to educators by September, 1963. | Teachers College Columbia University | 1963–64 | 22 |
| B-232 | A guide to programmed instructional materials available to educators by September, 1962. | Teachers College Columbia University | 1962 | 11 |
| HARBY, Samuel F.<br>B-221 | Study of audience response systems in teaching. | University of Miami Florida | 1961–62 | 5 |
| HARCLEROAD, Fred F.<br>B-394 | Development and an educational plan for the library-audiovisual services administration building for the California State College at Hayward. | Alameda State College | 1963–64 | 25 |
| HARLEY, William G.<br>BR7-0739 | Educational media council as a forum, dissemination, and consulting service an 18 month plan for self study operations and continuity. | Educational Media Council Washington, District of Columbia | 1967–68 | 59 |
| HARRISON, J. A.<br>B-139 | Survey of European research in audiovisual aids. | National Committee Audio-Visual Education | 1960–62 | 21 |
| HAZARD, Patrick D.<br>BR5-0276 | Feasibility study of the dissemination of information concerning the uses of newer communication in teaching English. | Beaver College Pennsylvania | 1966 | 18 |
| HILL, Harold<br>BR5-0080 | Mobilization of educational media resources to assist in federal programs of education and training. | Educational Media Council Washington, District of Columbia | 1965–67 | 155 |
| HITCHCOCK, Arthur A.<br>B-176 | National conference on guidance and the utilization of new media. | American Personnel and Guidance Association | 1961–62 | 40 |
| HOBAN, Charles F.<br>BR5-1198 | Survey of professional journals in the field of public communication and new media. | University of Pennsylvania | 1965–67 | 59 |
| HODGKINSON, Anthony W.<br>BR6-1535 | Investigation into the practice of screen education (the introduction of films and TV into education as an essential area of study). | Reading, Massachusetts | 1967–69 | 78 |
| HOLTZMAN, Paul D.<br>BR5-0989 | Interdisciplinary graduate programs in communications, a descriptive study. | Pennsylvania State University | 1963–64 | 54 |
| HOMME, Lloyd E.<br>B-487 | Demonstration of the use of self-instructional and other teaching techniques for remedial instruction of low-achieving adolescents in reading and mathematics. | TMI Institute New Mexico | 1965 | 63 |
| BR6-1530 | Use of contingency for remedial instruction of low-achieving adolescents. | Westinghouse Management Service | 1966–67 | 135 |
| HUCKLEBERRY, Alan W.<br>B-339 | Steering committee conference to plan a 5-year elementary and secondary curriculum study using visual aids in the education of the deaf. | Ball State University Muncie, Indiana | 1963 | 2 |
| HULL, Richard<br>BR5-0289 | Two depth seminars on current status continuous census and projected uses of TV in education for the next decade. | North Central Association of Colleges and Schools. | 1963–66 | 62 |
| HYER, Anna L.<br>B-063 | Title VII research abstracting project. | Department of Audio-Visual Instruction | 1961–62 | 19 |
| B-063a | A 2-year educational media research abstracting project. | National Educational Association | 1963–65 | 20 |
| BR6-8424 | Educational media research abstracting. | National Educational Association | 1965 | 5 |
| INGRAHAM, Rex<br>B-305 | Proceedings of the national conference on programmed audiovisual instruction in medical and dental education. | University of Southern California | 1963 | 12 |
| JACKSON, David M.<br>B-072 | Two films to demonstrate the use of film techniques in teacher education. | University of Illinois | 1960–61 | 42 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| JOHNSON, Richard A.<br>BR5-1000 | Pilot demonstration of the application educational television to the inservice training needs of teacher of the mentally retarded. | Minnesota State Department of Education | 1965–66 | 12 |
| JORDAN, James<br>BR5-0273 | National Instructional TV library demonstration project. | Indiana University | 1965–67 | 1,105 |
| KEMMERER, Walter W.<br>BR6-1246 | Measurement and analysis of quality impairment in the transfer of recorded TV programs. | Twin City TV Corporation Minnesota | 1966–67 | 21 |
| KEMP, Jerrold E.<br>B-191 | National workshop in educational media demonstrations. | San Jose State College | 1961–62 | 29 |
| KENT, Allen<br>B-170a | Preparation of a complete and exhaustive file of research abstracts in the educational media field. | Western Reserve University, Ohio | 1962–63 | 44 |
| B-170 | Information service of educational research materials. | Western Reserve University, Ohio | 1961–62 | 31 |
| KIEFFER, Jarold A.<br>B-152 | Role and function of radio, TV film, and the other new media in the permanent program of the national cultural center. | National Cultural Center | 1961–62 | 28 |
| KINNIEL, William T.<br>B-098, B-098a | Demonstration of the dissemination of information of new educational media by teacher demonstration teams. | Texas Educational Agency | 1962–63 | 176 |
| B-382 | State demonstration and evaluation of development pilot overhead transparencies for the subject areas of secondary science, math, English, modern foreign languages and geography. | Texas Educational Agency | 1964 | 83 |
| KOMOSKI, P. Kenneth<br>BR5-1184 | Demonstrated project of programmed TV instruction | Teachers College Columbia University | 1966 | 170 |
| BR6-2012 | Feasibility study of the potential of network TV as a distribution device for educational research information. | Teachers College Columbia University | 1966-67 | 35 |
| KONICK, Marcus<br>BR5-0271 | Demonstration model as e means to disseminate advancements in instructional uses of educational media. | State Department of Public Instruction Pennsylvania | 1965–67 | 45 |
| KNOWLTON, James Q.<br>B-297 | A socio and psycho linguistic theory of pictorial communication. | Indiana University | 1963–64 | 11 |
| KRESSE, Frederick H.<br>BR5-0710 | Material aids for teaching children, a project and evaluation multi-media kits for loan to elementary schools. | Children's Museum Boston, Massachusetts | 1964–68 | 393 |
| LAGRONE, Herbert F.<br>BR5-0278 | Project to improve the professional sequence in preservice teacher education through selective and planned use of new media. | American Association of Colleges for Teachers Education | 1963–65 | 216 |
| LANIER, Vincent<br>BR5-0229 | The uses of newer media in art education. | National Art Association Washington, District of Columbia | 1966 | 68 |
| LAWRENCE, Dick<br>BR5-0278 | Project to improve the professional sequence in preservice teacher education through selective and planned use of new media. | American Association of Colleges for Teacher Education | 1963–65 | 215 |
| LEWIS, Richard (Kemp)<br>BR5-0707 | Development of kits for presentations on educational media: Phase II. | San Jose State College | 1965–66 | 97 |
| LEYDEN, Ralph C.<br>B-245 | Planning of educational media for a new learning center. | Stephens College Missouri | 1962–63 | 16 |
| LIEBERMAN, Irving<br>B-252 | Recruitment and training of staff and support of staff dissemination activities at the American Library Association, Library 21, Exhibit Seattle World's Fair. | University of Washington | 1961–62 | 110 |
| LIPPITT, Ronald<br>BR7-0028 | Comparative study of literature on the dissemination and utilization of scientific knowledge. | University of Michigan | 1966–68 | 114 |
| LOHRER, Alice<br>B-144 | Identification and role of school librarius which function as instructional materials centers, with implications for training. | University of Illinois | 1961–62 | 32 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| LOUBRIEL, Oscar<br>B-194 | Effectiveness of two university courses. Demonstrate the effectiveness of the use of TV as a means to broaden the education of teachers in Puerto Rico. | University of Puerto Rico | 1961–62 | 54 |
| LOVE, Pauline J.<br>B-OOEb | Preparation, publication and distribution of "Guides to the Newer Educational Media, 1950–60." | American Library Association Chicago, Illinois | 1961 | 3 |
| LUMSDAINE, A. A.<br>B-057 | Experimental research on educational media. | University of California | 1960–62 | 18 |
| BR5-1340 | Editing and camera copy preparation of a manuscript on education media research methodology. | University of California | 1963 | 9 |
| LUNGAARD, Harriet<br>BR8-8050 | Revision, amplification and continuation in 1968 of compilation and distribution of the EMC directory of summer session courses on educational media in a fifth annual edition. | Educational Media Council Washington, District of Columbia | 1968–69 | 3 |
| LUNSFORD, Terry F.<br>B-284 | Northwest conference on TV in education, April 23-24, 1962. | Western Interstate Commission for Higher Education | 1962 | 3 |
| LYBRAND, William A.<br>BR7-1122 | Exemplary utilization of innovative media systems – four case studies. | American University | 1967–68 | 55 |
| McBRIDE, Jack<br>BR5-1010 | Demonstration of instructional TV program exchange by the Great Plains Regional Library. | | 1965–66 | 155 |
| McCLATCHEY, Merrill<br>B-OOD | Filmed reports on the use of new media for instructional purposes in modern foreign languages, general science, and mathematics. | National Educational TV Radio Center | 1959–63 | 117 |
| B-OODa | A filmed report of teaching practices using new instructional media for instructional purposes in the field of mathematics. | National Educational TV Radio Center | 1960–63 | 56 |
| McCLUER, V. C.<br>BR5-0302 | Feasibility of a cooperatively owned multipurpose multichannel, closed-circuit TV system for instructional materials distribution and administrative data handling. | Audio-Visual Corporation St. Louis | 1965 | 57 |
| McDONALD, L. E.<br>B-109 | Application of newer communication media in correspondence study. | University of Texas | 1961–62 | 17 |
| McGILL, John E.<br>BR5-1350 | Survey of the development and use of TV recorded materials, films, and other simulated materials for application to teacher education in extending professional laboratory experiences. | University of Illinois | 1963–64 | 9 |
| McINTYRE, Charles J.<br>BR5-0994 | Study of the implications and feasibility of the full application of technological aids to the solution of staff, space, and curriculum problems associated with a rapidly growing urban university. | University of Illinois | 1967 | 67 |
| McKENZIE, Jack<br>B-133 | TV in medical teaching and research. | Institute for Advancement of Medical Communication | 1961–63 | 46 |
| McMURRAY, Glen<br>BR5-1016 | Southern California automated cataloging project. | University of Southern California | 1964–66 | 113 |
| MALTZMAN, Edward<br>BR5-1410 | National conference of the uses of educational media in the teaching of music. | Music Education National Conference | 1965 | 74 |
| MARS, Walter J.<br>BR6-1565 | Project to improve instruction in teacher education through the increased and better use of the new educational media. | American Association of Colleges for Teacher Education | 1966–68 | 118 |
| MARTIN, Ann M.<br>BR5-1352 | Study of regional instructional media resources. | University of Pittsburgh | 1963–64 | 69 |
| MAY, Mark A.<br>BR5-0999 | Enhancements and simplifications of motivational and stimulus variables in audiovisual instructional materials. | Hamden, Connecticut | 1965 | 7 |
| MEIERHENRY, W. C.<br>BR5-1351 | Media and educational innovation, a symposium on identifying techniques and principles for gaining acceptance of research results use of newer media in education. | University of Nebraska | 1963–64 | 20 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| MEIR, Henry, W. C.<br>B-035 | Survey of the use of in-school telecast materials leading to recommendations as to their distribution and exchange. | University of Nebraska | 1960–61 | 48 |
| B-035a | Great Plains Regional instructional television library. | University of Nebraska | 1961–65 | 506 |
| BR5-0730 | Project to identify competencies needed by teachers in the use of the newer media and various approaches to achieving them. | University of Nebraska | 1965 | 18 |
| MILLER, Elwood E.<br>BR5-0281 | Development of practicable systems of film clips selection, packaging, storage, retrieval, information dissemination, distribution and projection. | Michigan State University | 1964–67 | 287 |
| MILLER, Harry L.<br>BR5-0998 | Patterns of educational use of a televised public affairs program. A study of metropolis — Creator or destroyer. | University of New York | 1966 | 23 |
| MILLS, Donald<br>BR5-1353 | Evaluation of an inservice television training program in math for elementary teachers. | | 1963–65 | 32 |
| MITZEL, Harold<br>BR5-1194 | Development and presentation of four different college courses by computer teleprocessing | Pennsylvania State University | 1964–66 | 219 |
| MOLSTAD, John (Farris)<br>B-086 | Identify and describe present organizational patterns, practices, equipment, and facilities utilized in preparation of visual materials for public school instruction and an exploration of application of recent technology to this area. | Indiana University | 1960–63 | 31 |
| MORFORD, Leslie K.<br>BR5-1139 | Study to determine the technical feasibility of interconnecting school districts in large geographic areas of low population density by electronic means for the provision of instructional and administrative services. | Central Michigan Education Department | 1966–67 | 67 |
| MORRIS, Barry<br>B-222 | Media demonstration and workshop for faculty members of teacher education institutions. | Florida State Department of Education | 1961–62 | 21 |
| MUKERJI, Rose<br>BR5-0309 | National demonstration project utilizing televised materials for the formal education of culturally disadvantaged preschool children. | United Planning Organization Washington, District of Columbia | 1966 | 50 |
| BR5-0312 | National demonstration project utilizing TV materials for the formal education of culturally disadvantaged preschool children. | United Planning Organization Washington, District of Columbia | 1966 | 206 |
| MURPHY, J. Fred<br>B-306 | Report of eight dissemination conferences on the principles and practices in the uses of TV in education. | Association of College and Secondary Schools Chicago | 1961–62 | 45 |
| B-30 | The uses of television in education. | Association of College and Secondary Schools, Chicago | 1959 | 5 |
| B-30a | Report of a pilot conference on the dissemination of principles and practices in the uses of TV in education. | Association of College and Secondary Schools, Chicago | 1960–61 | 26 |
| NOEL, Francis<br>B-106 | New Educational Media (including AV education) in State Departments of Education. | University of Southern California | 1961–63 | 163 |
| BR5-0295 | States audiovisual education study, a summary report. | Sacramento State College | | 21 |
| NORBERG, Kenneth D.<br>BR5-0282 | Iconic signs and symbols in audiovisual communication, an analytical survey of selected writings and research findings. | Sacramento State College | 1966 | 17 |
| B-083b | Pilot conference to explore ways and means of disseminating findings of research on news educational media. | Sacramento State College | 1959–60 | 1 |
| B-083c | Regional research conference on new educational media. | Sacramento State College | 1960–61 | 15 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| NORTH, R. Stafford<br>BR5-1002 | Demonstration of the impact of certain instructional changes on the attitudes and practices of students and faculty. | Oklahoma Christian College | 1965–67 | 72 |
| OFIESH, Gabriel<br>BR7-1042 | State of the art study of dial access information retrieval. | Catholic University | 1967–68 | 62 |
| ORR, David B.<br>BR7-9002 | Analyses and evaluation of present and future multimedia needs in higher education. | American Institute for Research in Behavioral Sciences | 1967–68 | 100 |
| OXHANDLER, Eugene<br>B-142 | Instructional materials for teaching audio-visual courses. | Syracuse University | 1961 | 7 |
| BR5-0272 | Computer simulation of a statewide film library network, a feasibility study. | Syracuse University | 1965–66 | 57 |
| BR5-1362 | A conference to develop new dimensions for research in educational media implied by the "systems" approach to instruction. | Syracuse University | 1963–64 | 27 |
| BR7-0259 | Prototype system for a computer based statewide plan film library network – a model for operation. | Syracuse University | 1966–67 | 81 |
| PARSEY, John M.<br>B-083e | Pilot conference to explore ways and means of disseminating findings of research on new educational media. | Michigan State University | 1960 | 3 |
| B-083f | Regional work conference to develop a theoretical framework for new media research and application. | Michigan State University | 1961–62 | 25 |
| PETERSON, Edwin<br>B-214 | Pilot short-term workshops for training college teachers in the effective use of a new method of instruction in English composition using overhead projection. | University of Pittsburgh | 1961–63 | 23 |
| POMEROY, Edward<br>B-084 | National conference on teacher education and new media. | American Association of Colleges for Teacher Education | 1960–61 | 33 |
| POWER, Eugene B.<br>B-145 | Microfilm storage and dissemination of Title VII research projects. | University Microfilms Ann Arbor, Michigan | 1961–62 | 2 |
| PURPEL, David<br>BR5-0991 | Planning of an instructional media system for the Harvard Graduate School of Education. | Harvard University | 1964–65 | 25 |
| RAMEY, J.W.<br>B-133a | Preparation of a manuscript on the uses of TV in medical education. | Institute for Advancement of Medical Communication Bethesda, Maryland | 1963–64 | 4 |
| RAY, Henry W.<br>BR5-1026 | Instructional media and heuristic learning. | Centennial School District Warmister, Pennsylvania | 1965–66 | 59 |
| REID, Chandos (Margaret Gill)<br>B-050 | Theoretical framework for the development and utilization of educational media and materials. | Association for Supervision and Curriculum Development Washington, District of Columbia | 1959–60 | 18 |
| REID, Scarley<br>B-077 | U.S. Government films for public educational use; 1960. | Library of Congress | 1960–61 | 28 |
| B-077a | Preparation and publication of U.S. Government film for public educational use; 1963. | Library of Congress | 1963 | 6 |
| RICHLAND, Malcolm<br>BR5-0303 | Traveling seminar and conference for the implementation of educational innovation. | System Development Corporation, California | 1965 | 153 |
| ROBINSON, Thomas P.<br>BR5-1346 | Learning resources center for the U.S. Virgin Islands, a feasibility study. | Laboratory for Educational Materials | 1963–64 | 10 |
| RUARK, Henry C.<br>B-106b | State department of Education responsibilities for the use of new educational media in public elementary and secondary schools. | State Department of Education Salem, Oregon | 1962 | 1 |
| RUGG, K. C.<br>B-002 | Improving instruction – budgeting your audiovisual program. | Indiana University | 1959–60 | 11 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| RYANS, David G.<br>B-216 | Review and assessment of Title VII, NDEA programs. | System Development Corporation, California | 1961 | 6 |
| SCHENKKAN, R. F.<br>B-058, B-058a | Field study in the wider use of faculty resources among a number of institutions of higher education by means of closed-circuit microwave TV. | University of Texas | 1959–62 | 12 |
| B-058b | Temp, Texas educational microwave. | University of Texas | 1963 | 370 |
| SCHEIN, Jerome<br>B-200 | Survey of visual aids in schools and classes for the deaf in the U.S. | Gallaudet College | 1961–62 | 8 |
| SCHULLER, Charles F.<br>B-085 | Conference to explore the desirability and feasibility of establishing a council of media organizations. | Michigan State University | 1960 | 3 |
| B-085a | Second conference to discuss the desirability and feasibility of establishing a council of media organizations. | Michigan State University | 1960 | 3 |
| B-085b | A conference of the educational media council. | Michigan State University | 1960–61 | 4 |
| B-118 | A survey of the audiovisual instructional programs, resources, and services of educational institutions in the State of Hawaii. | Michigan State University | 1960 | 4 |
| SCHRAMM, Wilbur<br>BR7-1123 | Summary of the research on instructional TV, and other media research relevant to it. | Stanford University | 1967 | 24 |
| BR7-0873 | ERIC Clearinghouse for educational media and technology. | Stanford University | 1967–70 | 286 |
| B-322 | Research on programmed instruction, an annotated bibliography. | Stanford University | 1962–64 | 27 |
| B-017 | Education and the new media (an exploration of needed research in educational use of the new media). | Stanford University | 1959–60 | 15 |
| B-017a | Educational TV: the next ten years. | Stanford University | 1960–61 | 53 |
| B-158 | People look at educational TV, report on and from the audiences of eight representative ETV Stations. | Stanford University | 1961–62 | 60 |
| SCHUELER, Herbert<br>BR5-1348 | Teacher education and the new media. | City College of New York | 1962–64 | 18 |
| SCOTT, Donald<br>B-118b | A survey of the audiovisual instructional programs, resources, and services of educational institutions in the State of Hawaii. | Neenah, Wisconsin | 1960 | 2 |
| SECREST, James D.<br>B-143 | Technical guide for the purchase and use of language laboratory facilities and equipment. | Electronic Industry Association Washington, District of Columbia | 1961 | 11 |
| SEIBERT, Warren F.<br>B-087 | International seminar on instructional TV. | Purdue University | 1961–62 | 33 |
| SHERMAN, Mendel<br>BR5-0265 | Study to formulate quantitative guidelines for the audiovisual communications field. | Indiana University | 1964–67 | 44 |
| SIDNELL, Robert<br>BR5-1083 | Development of self-instructional drill materials to facilitate the growth of score reading skills of student conductors. | Michigan State University | 1966–67 | 10 |
| SKELLY, Harry J.<br>B-118a | A survey of the audiovisual instructional programs, resources and services of educational institutions in the State of Hawaii. | Sacramento, California | 1960 | 2 |
| SKORNIA, Harry J.<br>B-008 | Feasibility and role of state and regional networks in educational broadcasting. | National Association of Educational Broadcasters | 1959 | 10 |
| SMITH, Dorothy<br>B-220 | Study of the problems of copyrights, royalties, compensation, and rights of teachers in the production, performance and distribution of educational TV and radio programs, educational films, and programs for teaching machines. | American Council on Education Washington, District of Columbia | 1961–62 | 68 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| STANLEY, Julian C.<br>B-236 | Curriculum guide for a course in educational media research. | University of Wisconsin | 1962 | 6 |
| STEPP, Robert E.<br>BR5-1356 | Feasibility study to investigate the instrumentation, establishment, and operation of a learning laboratory for hard-of-hearing children. | University of Nebraska | 1963–64 | 39 |
| STONE, W. George<br>B-020 | Materials list for teacher of modern foreign languages. | Modern Language Association of America | 1959 | 12 |
| SUPPES, Patrick<br>BR6-1493 | Stanford program in computer-assisted instruction. | Stanford University | 1966–67 | 1,018 |
| TANZMAN, Jack<br>B-353 | Study to explore the role and feasibility of a regional educational communications center. | Plainview Public School, New York | 1963–64 | 61 |
| TAUBER, Maurice F.<br>B-00A | Feasibility study regarding the establishment of an educational media research information service. | Teachers College Columbia University | 1959–60 | 21 |
| BR5-0231 | Conference on the use of printed and audiovisual materials for instructional purposes. | Teachers College Columbia University | 1966 | 13 |
| TAYLOR, Calvin<br>BR5-1018 | Instructional media and creativity on the Torrey Pines Conference | University of Utah | 1955 | 13 |
| TETTEMER, Clair<br>B-096 | Study of the feasibility of developing demonstration materials of classroom utilization of educational broadcasts. | National Association of Educational Broadcasters | 1960–61 | 6 |
| BR5-1012 | Pilot series of six kits of filmed and published materials illustrating proper teacher utilization of broadcast materials. | National Association of Educational Broadcasters | 1963–64 | 155 |
| THORNBLAD, Carl E.<br>BR7-0715 | Great cities research council educational communications project. | Chicago, Illinois | 1967–68 | 129 |
| TICKTON, Sidney<br>BR8-0571 | Operation of the commission on instructional technology and preparation of a report on a study of new instructional technology. | Academy for Educational Development | 1968–69 | 500 |
| USLAN, David T.<br>BR7-1143 | Feasibility of using an experimental laboratory for identifying classroom multimedia problems and requirements. | System Development Corporation Falls Church, Virginia | 1967–68 | 50 |
| VANDERMEER, A. W.<br>B-083d | Regional research conference on new educational media. | Pennsylvania State University | 1960–61 | 15 |
| VENTO, Charles<br>BR6-8910 | Systems approach for automating the cataloging and distribution of educational motion pictures. | University of Southern California | 1967–68 | 8 |
| VINSONHALER, John<br>BR5-1144 | Improving accessibility of educational materials. Retrieval of educational and psychological tests. | Michigan State University | 1966–67 | 16 |
| WAGNER, Robert W.<br>B-131 | Series of motion picture documents on communications theory and the new educational media. | Ohio State University | 1961–62 | 6 |
| BR5-0294 | Series of motion picture documents on communication theory and the new educational media. | Ohio State University | 1963–65 | 160 |
| BR6-2775 | Completion of a series of motion picture documents on communication theory and the new educational media. | Ohio State University | 1966 | 40 |
| WHALEY, Randall M.<br>B-022 | Evaluation of new curricula developments and new techniques of instruction. | National Academy of Sciences | 1959–60 | 20 |
| B-267 | Feasibility study for establishing a pilot center for analysis and demonstration of educational resources at Wayne State University. | Wayne State University | 1963–64 | 17 |
| WHITE, Harvey<br>BR5-0432 | Planning, construction, and evaluation of media for teaching high school and junior college science via TV and for use in self-instruction. | University of California | 1963–65 | 274 |

| NAME | PROJECT | LOCATION | DATE | AMOUNT (in thousands) |
|---|---|---|---|---|
| WHITE, Hervey<br>BR6-2435 | Planning, construction, and evaluation of media for teaching high school and junior college science via TV for use in self-instruction. | University of California | 1966–67 | 93 |
| WILDS, Preston<br>BR5-1145 | Demonstration of clinical programming methods and dissemination of results of self-instruction clinical problem-solving project. | Medical College of Georgia | 1966–68 | 135 |
| WILLIAMS, Catherine<br>B-354 | Development of packaged programs designed to enable groups of teachers to carry on their own inservice audiovisual instructional programs. | Ohio State University | 1963–65 | 74 |
| WILLIAMS, Don G.<br>B-066 | Motion picutre production facilities of selected colleges and universities. | University Film Foundation | 1960–62 | 26 |
| WILSON, Roy K.<br>B-161 | Conference on dissemination of information on newer educational media, report of national school public relations association. | National Education Association | 1960–61 | 3 |
| WITHERSPOON, John P.<br>BR7-1021 | Planning instructional TV facilities. | Brooks Foundation | 1967–68 | 40 |
| BR5-0995 | Educational communications system. | National Association of Educational Broadcasters. | 1966 | 145 |
| WITTICH, Walter A.<br>B-117 | Demonstration of inservice teacher training in audiovisual education via TV and related news media. | University of Wisconsin | 1960–61 | 52 |
| WOOLSEY, Frank M.<br>BR5-1358 | Conference on the uses of two-way networks in medical education. | Albany Medical College of Union University. | 1964 | 17 |
| WYMAN, Raymond<br>BR5-1344 | Study of the availability of locally produced overhead transparencies and recommendations for national distribution. | University of Massachusetts | 1964–65 | 19 |
| BR5-1014 | Study of the availability of locally produced overhead transparencies and recommendations for national distribution. | University of Massachusetts | 1965–66 | 29 |
| ZANT, James H.<br>BR5-0708 | Project for the improved use of newer educational media in elementary school mathematics. | Oklahoma State University | 1965 | 55 |

## ESTIMATED OBLIGATIONS FOR INSTRUCTIONAL (audiovisual) MATERIALS [developed from U.S.O.E. Reports]

| FISCAL YEAR | | 1959-1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970* |
|---|---|---|---|---|---|---|---|---|---|---|
| NDEA | III | $ | $ | $ 6,514,800 | $ 5,993,900 | $5-6,000,000 | $ 9,000,000 | $ 10,444,780 | $ 10,000,000 | $ 0 |
| | I | | | | | 30,000,000 | | | | 0 |
| | II | | | | | 12,000,000 | | | | 0 |
| ETV FACILITIES | | | 6,440,000 | 6,440,000 | 6,440,000 | 6,440,000 | 6,440,000 | 0 | 4,000,000 | 4,000,000 |
| CAPTIONED FILMS FOR DEAF | | | ? | 645,000 | 645,000 | 1,703,000 | 1,110,230 | 1,037,289 | 1,920,000 | 2,220,000 |
| VOCATIONAL EDUCATION | | | | 5,000 | 17,100 | 42,000 | 80,000 | 100,000 | 150,000 | 165,000 |
| PUBLIC LIBRARIES - COMMUNITY SERVICE | | | | 6,000 | 43,900 | 110,000 | 972,000 | 1,000,000 + 21,000 Adult Ed | 1,000,000 + 25,000 Adult Ed | 490,000 + 25,000 Adult Ed |
| HIGHER EDUCATION | I | | | | | 6,000 | 6,060 | 6,060 | 6,000 | 6,000 |
| | II | | | | | 160,000 | 6,126,672 | 6,369,219 | 6,730,000 | 3,365,000 |
| | VI | | | | | 700,000 | 4,000,000 | 5,190,159 | 6,600,000 | 0 |
| HANDICAPPED ESEA | I | | | | | 30,000,000 | 15,000,000 | 24,500,000 | 22,000,000 | 22,000,000 |
| | II | | | | | 12,000,000 | 21,400,000 | 23,000,000 | 14,000,000 | 0 |
| | III | | | | | 5,000,000 | 7,000,000 | 8,000,000 | 8,500,000 | 6,030,000 |
| TEACHER EDUCATION | | | | | | 82,000 | 82,000 | 82,000 | 83,500 | 88,000 |
| R & D | | | | | | 21.935 | 42,510 | 21,935 | 19,680 | 18,724 |

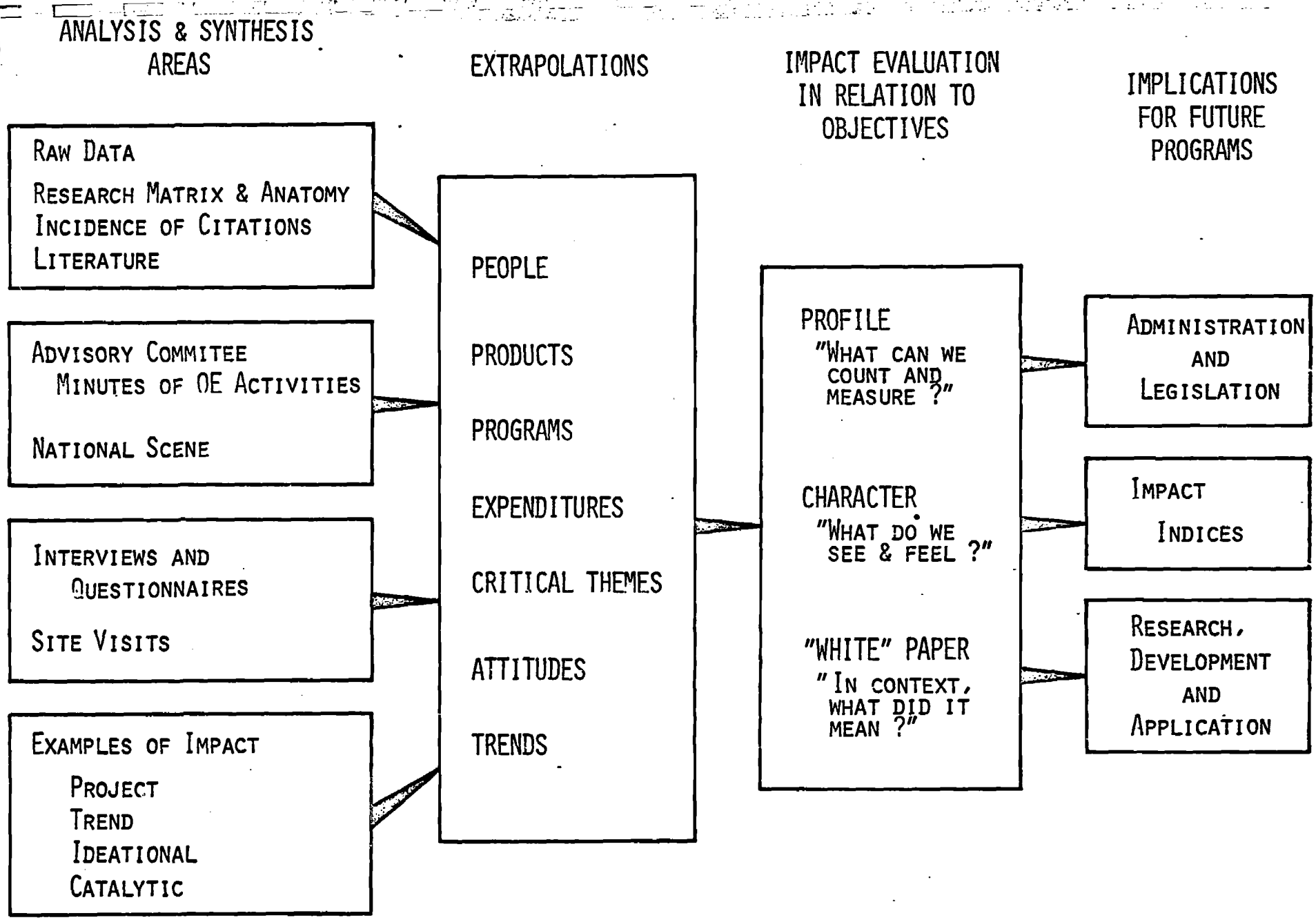
*NO SEPARATE BREAKDOWNS AVAILABLE, AVERAGE ANNUAL EXPENDITURE 50 MILLION*

* Revised Nixon Estimates

## MAJOR LEGISLATION FOR SUPPORT OF NEW MEDIA AND TECHNOLOGY

*(includes legislation affecting or directly relevant to Title VII, NDEA)*

| TITLE | DATE SIGNED | LAW NO. (BILL NO.) | INTRODUCED BY | EFFECT ON MEDIA | DIRECT EFFECT ON TITLE VII |
|---|---|---|---|---|---|
| National Defense Education Act | Sept 7 58 | PL 88-864 (HR 13247) | Hill Elliott | III-strengthening math, science, language instruction | Established Title VII |
| NDEA Amendments 1961 | Oct 3 61 | PL 87-344 (S 2393) | Hill Elliott | | 2-year NDEA extension |
| ETV Facilities Act | May 1 62 | 87-447 (S 205) | Magnuson (Committee Interstate & Foreign Commerce | ETV construction; matching grants with states | -- |
| Vocational Education Act of 1963 (NDEA Amendments) | Dec 18 63 | 88-210 (HR 4955) | Perkins | III-includes test grading and av library equipment | 1-year NDEA extension VII: to include "printed and published materials" |
| NDEA Amendments of 1964 | Oct 16 64 | 88-665 (S 3060) | Morse | Title XI-institutes for teachers; includes "educational media specialists" + school librarians, English & social science | 3-year NDEA extension |
| Elementary &Secondary Education Act | Apr 11 65 | 89-10 (HR 2362) | Morse Perkins | Titles I, II, III, IV Amdnds Cooperative Research Act | -- |
| Higher Education Act of 1965 | Nov 8 65 | 89-329 | Morse Powell Green | Title VI:<br>A. equipment:AV + TV<br>B. faculty dev. - institutes | -- |
| Elementary &Secondary Education Amendments 1966 | Nov 3 66 | 89-750 (HR 13161 | Perkins Morse | ESEA VII: "Dissemination of information by Commissioner to State, local, educational agencies + others<br>Amends Coop Research Act research through contracts as well as grants and consolidates research authority<br>new Title VI: education of the handicapped<br>Title III: Adult Education Act of 1966 (grants to ... ETV stations, use of innovative methods, system materials .. | -- |
| Higher Education Amendments of 1966 (NDEA Amendments) | Nov 3 66 | 89-752 (HR 14644) | Green | NDEA III: includes industrial arts | VII through FY 68 |
| Educational Professions Development Act | June 29 67 | PL 90-35 | Perkins | Higher Education Act Amendment: V-c: educational media "including educational + instructional tv and radio" | -- |
| Public Broadcast Act of 1967 | Nov 7 67 | PL 90-129 | Magnuson (Commerce + Communications) | ETV construction Corporation for Public Broadcasting | -- |
| Elementary &Secondary Education Amendments 1967 | Jan 2 68 | PL 90-247 | Brademas Morse | ESEA VI: Education of Handicapped Act: research, production, distribution educational media<br>ESEA III: emphasis on innovative<br>Amends Cooperative Research Act | NDEA VII; no change from appropriations through June 30 1968 |
| Higher Education Amendments of 1968 | Oct 16 68 | 90-575 (S 3769) | | Title VIII (new): Networks for Knowledge<br>Higher Education Act VI: Instructional computers eligible; new section 1206 "Dissemination of Information by Commissioner" | NDEA VII: permitted to expire (also VB + XI) |




TITLE VII STUDY RATIONALE

# PROJECT DIRECTORS QUESTIONNAIRE RESPONDENTS

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Andereck, Paul A.
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Shemick, John M.
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Skornia, Harry J.
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Stuckless, E. Ross
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Tickton, Sideny G.
Tiedeman, David V.
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Tobias, Sigmund
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Vento, Charles J.
Vlcek, Charles W.
Vuke, George J.
Warf, Dave
Wedberg, Desmond P.
Wickline, Lee E.
Wilds, Preston Lee
Williams, Catherine M.
Williams, Don G.
Witherspoon, John P.
Wittrock, M. C.
Wood, C. David
Zachert, Virginia

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Bright, R. Louis (T)
Clemens, Tom (P)
Edling, Jack (T)
Gordon, Roger (T)
Guedry, Perry (T)
Hall, Roy (T)
Koenig, Adolph (L) (W)
McKee, Guy(T)
McKeegan, Hugh (T)
McPherson, James (P) (T)
Meaney, John(T)
Molnar, A. (L)
Norberg, Kenneth (P)
Siebert, Warren (W)
Spaulding, Seth (W)
Stone, C. Walter (T)
Torkelson, Gerald (P) (T
Vandermeer, A.W. (P) (T)

## USOE COMMISSIONER-DEPUTY, BUREAU CHIEF LEVEL

Bright, R. Louis (T)
Derthick, Lawrence (T)
Flynt, Ralph (P) (T)
Howe, Harold (W)
Keppel, Francis (W)
McMurrin, Sterling (T)

T = Telephone interview
P = Personal interview
W = Written response to questionnaire
L = Project liaison, Project Advisory Committee

# ADVISORY COMMITTEE ON NEW EDUCATIONAL MEDIA

| | *Category* |
|---|---|
| Abramson, Marion P. | IV |
| *Bailey, Thomas D. | II |
| Bennet, Lerone | IV |
| Bennington, Neville L. | II |
| Birkmaier, Emma | I |
| Bomar, Cora P. | III |
| *Bowers, Nancy | IV |
| Brace, Clayton H. | IV |
| *Carpenter, C Ray | III |
| *Carroll, John B. | III |
| Caudill, William | III |
| Codwell, John E. | II |
| Cowan, Louis | III |
| *Culkin, Reverend John | III |
| *Davison, W. Phillip | IV |
| Dees, Bowen C. | V |
| Divizia, Margaret | II |
| *Dolce, Carl | II |
| Dunn, Reverend Hugh E. | I |
| *Fletcher, C. Scott | III |
| Foncannon, Howard | V |
| *Gagne, Robert | III |
| Gardner, John W. | IV |
| Goldstein, J. Richard | IV |
| Golterman, Elizabeth | II |
| *Grant, William | IV |
| Gross, Calvin | II |
| *Hazard, Leland | IV |
| *Hovde, Frederick | I |
| *Hull, Richard B. | III |
| *Hunter, Armand | I |
| *Kelly, Harry C. | V |
| *Kelson, Keith | V |
| Knox, Sarah H. | II |
| Larson, Lawrence C. | III |
| Lewis, Philip | II |
| | III |
| *MacLean, Malcolm | III |
| *Meadows, Austin R. | II |
| Meierhenry, Wesley C. | III |
| McGill, Ralph E. | IV |
| *Miller, Harriet | II |
| *Mitchell, Wanda B. | II |
| Nabrit, Samuel L. | I |
| *Nostrand, Howard Lee | I |
| Ofiesh, Gabriel | III |
| *Reinert, Reverend Paul | I |
| *Roe, Arthur | V |
| Saudek, Robert E. | III |
| *Schramm, Wilbur | III |
| *Seaborg, Glenn T. | I |
| *Skornia, Harry J. | III |
| Slavin, Reverend Robt. | III |
| *Spaulding, William E. | IV |
| Wittcoff, Raymond | IV |
| *Zacharias, Jerrold | I |

*Those who responded to the Advisory Committee letter of inquiry.

I - Higher Education: Content

II - Supervision: Elementary and Secondary

III - Media

IV - Lay Public

V - NSF

## PROJECT PERSONNEL

### ADVISORY COMMITTEE

SIDNEY P. MARLAND, JR. (also Project Principal Investigator)

Dr. Marland is President of the Institute for Educational Development. Previously, he was Superintendent of Schools in Pittsburgh, Pennsylvania; Winnetka, Illinois; and Darien, Connecticut. He serves on the boards of National Educational Television, National Merit Scholarship Corporation, the Commission on Tests of the College Entrance Examination Board, and is past president of the Research Council of the Great Cities Program for School Improvement.

R. ANN DAVIS

Mrs. Davis is Director of Educational Media for the Virginia Beach City Public School System, Virginia Beach, Virginia. She started as an elementary school teacher and in 1958 was appointed coordinator of art and audiovisual education. She is currently vice chairman of the Audiovisual Department of the Virginia Library Association, and a member of the NEA, DAVI, and ALA, a member of the Advisory Committee for Title II for the Virginia State Board of Education.

JOHN C. HONEY

Dr. Honey is Vice President for Governmental Affairs and Research, Syracuse University. He is also director of a Syracuse University-NASA research program, and acting director of the Latin American Studies Program in the Maxwell Graduate School of Citizenship and Public Affairs. He was formerly associate director of the Institute of Public Administration, executive associate of the Carnegie Corporation of New York, and director of the Government Studies Program at the National Science Foundation.

WILLIAM J. PAISLEY

Dr. Paisley is Director of the ERIC Clearinghouse for Educational Media, Stanford University. He joined the Stanford faculty in 1965 as assistant professor of communication and research associate, Institute of Communication Research. He was a recent contributor to the Annual Review of Information Science and Technology, and his areas of interest and publication include communication research, verbal behavior, and attitude change.

ROBERT EARL STAKE

Dr. Stake is Associate Director, Center for Instructional Research and Curriculum Evaluation, and professor of educational psychology, University of Illinois. He is a consultant to the U. S. Office of Education, the Joint Council on Economic Education, and editor of the American Educational Research Association Monograph Series on Curriculum Evaluation.

DON WHITE

Don White has been in the audiovisual field for over 30 years, starting as head of the Audiovisual Service of the University of Georgia. Since 1946, he has served as executive vice-president of the National Audiovisual Association. He is currently a consultant to the U. S. Office of Education and a member of the District of Columbia Vocational Rehabilitation Council. He has served as a registered lobbyist in Washington, working primarily on educational legislation, for more than a decade.

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