R E P O R T R E S U M E S

1. ED 013 781 SP 001 240
2. EDUCATIONAL MEDIA IN INSTRUCTIONAL SYSTEMS DEVELOPMENT AT THE OHIO STATE UNIVERSITY.
3. BY- MILLER, THOMAS E.
4. OHIO STATE UNIV., COLUMBUS, RESEARCH FOUNDATION
5. REPORT NUMBER BR-5-1078 6. PUB DATE JUN 67
8. CONTRACT OEC-3-6-05178-0605
EDRS PRICE MF-$0.50 HC-$3.20 7. 80P.

DESCRIPTORS- BIBLIOGRAPHIES, *CURRICULUM DEVELOPMENT, CURRICULUM PLANNING, EDUCATIONAL CHANGE, EDUCATIONAL EXPERIMENTS, EDUCATIONAL METHODS, EVALUATION, *INSTRUCTIONAL INNOVATION, LITERATURE REVIEWS, *MEDIA RESEARCH, MODELS, SYSTEMS ANALYSIS, OHIO STATE UNIVERSITY

TO ELIMINATE THE PROBLEMS ARISING FROM THE ACQUISITION OF INAPPROPRIATE MEDIA MATERIALS AND EQUIPMENT, AN INSTRUCTIONAL SYSTEMS UNIT WAS DESIGNED, TESTED AND EVALUATED AT OHIO STATE UNIVERSITY SCHOOL OF EDUCATION. THE SYSTEM, DEVISED WITH THE AID OF A REVIEW OF THE APPROPRIATE LITERATURE, CONSISTS OF FIVE PHASES--(1) IDENTIFYING THE PROBLEM AND PEOPLE INVOLVED, (2) PLANNING THE CURRICULUM TO MEET LEARNER GOALS, (3) BUILDING THE TRIAL LEARNING ENVIRONMENT, (4) TESTING AND REVISING THE ENVIRONMENT, AND (5) DISSEMINATING THE RESULTS. AS A TEST, THE SYSTEM WAS USED TO DESIGN AND IMPLEMENT AN EDUCATIONAL ORIENTATION COURSE AT OSU. EVALUATION OF THE COURSE WAS LIMITED BUT GENERALLY FAVORABLE, AND IS BEING CONTINUED. IT IS CONCLUDED THAT THE SYSTEM IS WORTHWHILE IN THAT IT (A) ENCOURAGES A MORE ANALYTICAL EXAMINATION OF INSTRUCTIONAL PROGRAMS IN TERMS OF THEIR NEEDS AND EFFECTIVENESS, (B) EMPLOYS THE TEAM APPROACH IN THE CURRICULUM DESIGN, (C) REQUIRES DEFINITIVE STATEMENTS OF LEARNER GOALS, ENVIRONMENT DESIGN AND EVALUATION, (D) MAKES IT POSSIBLE FOR THE TEACHER TO STUDY AND DESIGN HIS INSTRUCTION WITHIN A MINIMUM TIME, (E) REDUCES FAILURE IN INSTRUCTIONAL INNOVATION AND (F) INCREASES THE DISSEMINATION OF INFORMATION DEALING WITH EDUCATIONAL CHANGE. IT IS RECOMMENDED THAT INSTITUTIONS OF HIGHER EDUCATION CONSIDER THE ESTABLISHMENT OF A SIMILAR SYSTEM FOR SUPPORTING PLANNED CHANGE. (AW)

FINAL REPORT

Project No. 5-1078
Contract No. OEC 3-6-05178-0605

EDUCATIONAL MEDIA IN INSTRUCTIONAL SYSTEMS DEVELOPMENT AT THE OHIO STATE UNIVERSITY

June 1967

U.S. DEPARTMENT of
HEALTH, EDUCATION, and WELFARE

Office of Education
Bureau of Research

The Ohio State University
Research Foundation
Columbus, Ohio 43212

EDUCATIONAL MEDIA IN INSTRUCTIONAL SYSTEMS DEVELOPMENT AT THE OHIO STATE UNIVERSITY

Project No. 5-1078
Contract No. OEC 3-6-05178-0605

Thomas E. Miller
III

June 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

The Ohio State University

Columbus, Ohio

TABLE OF CONTENTS

INTRODUCTION

Among the several areas of "explosions" in contemporary society are the numbers of people who want more formal education, the needs of our society which call for more education, and the amount of "knowledge" which is available to direct the activities of the society. Institutions of higher education, having ignored the tremors of these explosions for many years, must now find unique ways to perform its functions if they are to survive.

Enrollments in universities and colleges in the United States shot up from 3 million in 1960 to 5 million in 1965. Projections for 1970 are 7 million; for 1975, 8.6 million. The Ohio State University as one of the "Big Ten" Midwestern institutions of higher learning has shared in the student boom, recording an increase in enrollment from 23,349 in 1960 to over 42,000 in 1966.

Expanded enrollments have put considerable strain on the instructional resources of universities. In some cases these resources have been spread thin as classes have swelled into the 500's; untrained graduate students have taken over instructional duties from trained faculty; and individual attention to the student has become nearly impossible.

One of the responses made by university faculties and departments to the present educational crisis has been to look to the new educational technology to be able to cope with the problem of numbers. This response, though educationally and psychologically appropriate, has not been always functionally adequate or efficient. The single most important reason for this inadequacy lies in the nature of educational technology itself and in the complexity and sophistication of the required response.

During the last ten years or more educational technology has become a highly specialized discipline. The expert educational technologist, for instance, would no longer talk in terms of random additions of films to the school film library, or of new projectors to the equipment pool. Nor would he be excited about acquiring a closed-circuit television system for his school district or a university department. As a good professional he would most likely think in terms of "instructional systems" that are both technological and psychological. In the process of applying technology to instruction he will proceed through reviewing educational needs, defining instructional objectives in terms

of terminal behaviors, and analyzing curriculum for building instructional media systems.

The use of media for solving instructional problems is, therefore, no longer common sense. It is a specialization requiring professional planning. Now, we do not have expert educational technologists working in each of the different departments and schools in our universities. The departmental faculties are therefore left to their own devices in the planning and installation of educational media when they do turn to educational technology for solving instructional problems. These departmental faculties in universities, no doubt distinguished in their own fields of specialization, are understandably not educational technologists and they bring to bear mostly common sense approaches to the specialized task of building instructional media systems. The media facilities resulting from such decision-making may generally be technically operative but often fall far below their potential in providing educational environment.

Common sense approaches to installation of media systems in universities may lead to (a) acquisition of expensive but unsuitable materials and equipment, (b) media-centered strategies rather than objectives-related approaches to instructional problems, and (c) neglect of training needs of instructors and faculty for effective use of newly installed instructional media facilities.

Most universities are already facing some of the problems indicated above. Some of the instructional media systems installed in different departments of the university are going through comprehensive self-analysis. Many problems will arise as university departments seek to install instructional media systems to meet their instructional needs. But these increasing problems will only find inadequate or indifferent solutions unless a system for an expert handling of these problems is designed and instituted in universities.

It was the general objective of this project to create a system whereby problems arising from acquisition of inappropriate materials and equipment, installation of media systems not integrated with total instructional objectives, or from neglect of training in media utilization could be eliminated through systematic analysis of individual needs, and definition and specification of media requirements. Evaluations are still necessary but they will involve answering different types of questions - questions related to maximization of outputs rather than those dealing with complete dismantling or overhauling of a system hurriedly installed.

The specific purposes of the project were:

A. To set up an "Instructional Systems Unit in the University - a system for system building, based on institutionalized procedures and facilities to insure that the faculty: (a) were informed of the possibilities of educational technology as one of the ways for solving instructional problems; (b) had access to the "resources of expertise" of system analysts, evaluation and testing experts, media specialists, engineers, and curriculum specialists in designing, specifying and installing instructional media systems; and (c) had the opportunity to acquire technical and pedagogical skills for using the new systems efficiently and innovatively.

B. To test operational and functional efficiency of the "Instructional Systems Unit" so established in a pilot project with the School of Education, Ohio State University.

C. To build a fund of experience to form the basis for recommendations to the University to regularize the "Instructional Systems Unit" for working with other departments, schools, and faculty at Ohio State campus.

METHOD

The procedures of this project included three phases, corresponding to the project objectives.

Phase I - Establish within the School of Education, The Ohio State University, an "Instructional Systems Unit" and establish the most appropriate procedures for planning and building an innovative instructional system.

Phase II - Undertake a pilot project to test the design and procedures of the system.

Phase III - Subjectively evaluate the effectiveness of the system as it served the change process in the pilot project, and, on the basis of this evaluation, prepare recommendations to the University for further use of the system.

In order to design the system for supporting innovation in the University, a considerable review was made of the literature concerning the general change process in society, and the change process in education. Literature in the areas of systems analysis and design, curricula design and the newer curricula, and educational technology and media were also reviewed. A study was made of other activities dealing with planned change in higher

education, including those at Michigan State University, The University of Wisconsin, and the University of Illinois at Chicago. Through these studies, a "System for Planned Change in Higher Education" was designed. This system, explained in detail in Appendix I, contains five phases, including a preliminary phase for identifying the problem and the people to be involved, a phase for planning the curriculum to meet learner goals, a phase for building the trial learning environment, an operational phase to test and revise the environment, and finally, a dissemination phase.

A pilot project was undertaken in order to "try out" the system. (This was a "trial" project rather than a "test" project because no formal comparative evaluation was made.) The pilot project began with a need, realized in the School of Education, for a course through which students would be able to make appropriate choices of careers in education. The existing course in educational orientation had received considerable criticism.

The process followed in the pilot project was basically that of the proposed System for Planned Change. After the problem was identified and a complete statement of the problem was made, personnel were selected to perform certain functions. Personnel included the "Center" Director, Project Coordinator, Project Director and his staff, the department head, and the required consultants. These personnel were involved in the project as directed by the System. (See Appendix II)

During the Planning Phase, objectives were established on several levels and the curriculum for the new orientation course was developed. Decisions made in the curriculum design were based on the statements of learner goals and what was known of the learner and how learning takes place. Experiences were selected through which the learner could establish the stated behavior. Learning environments were designed which would allow these experiences. The learning environments made use of the most appropriate methods, learner grouping, materials, equipment and facilities.

During the Building Phase, the learning environment was "put together." According to the learning environment design, an independent study laboratory was developed which contained 32 study carrels with audio and projection equipment. Materials were prepared for independent study, small group discussions and large group presentations. Facilities were scheduled, as were the staff and students.

Because of the short period of this program (one year), it was not possible to develop the environments required for the entire course. Specifically, materials needed for the individual study could not be found or produced in the quantities required. During the two quarters in which the pilot project was tried and evaluated, only a small number of "units" were studied according to the experiences listed in the planning phase. Evaluation of the new course itself has been limited and this has been largely subjective. However, there have been subjective indications, including some objective testing, that the new course is meeting the student needs.

The planned change in this course has not reached the operational phase, and dissemination of the partial results would be premature. However, the pilot project is continuing and at the time of the writing of this final report, plans are to continue with this change project.

During the Pilot Project Phase, there was continual testing and refinement of the System. The final design of the System is being recommended for adoption by The Ohio State University as this report is made.

One outcome of this project was the preparation of a pamphlet written for the administrators who may wish to consider establishing a System for Planned Change. The pamphlet, titled "Planned Change in Higher Education Curriculum Design," proposes reasons for planned change, and suggests a "System for Planned Change" in several phases. It also describes the beginnings of a pilot change project, and lists certain key resources for use in studying the change process. The pamphlet is enclosed as Appendix III of this report.

RESULTS

Evaluation of the System for Planned Change, through its trial in the Pilot Project, indicates that this system is useful in encouraging and assisting the University faculty in their efforts to bring about systematic improvements in their teaching. The major advantages of the system use appear to be:

1. It encourages a more serious and analytical look at existing instructional programs in terms of their needs and effectiveness.

2. It requires definitive statements of needs, objectives, learner goals, environment design and evaluation.

3. It calls for a team approach - using several specialists - in the design of the curriculum.

4. Through the use of specialists when and where they are needed, it allows the teacher to do an in-depth study and design of his instruction with a minimum of his time investment. He can now "fit-in" time for innovation planning.

5. Chances of failure are reduced. This assumption is helpful in encouraging faculty to consider change and the administration to consider funding for the change.

6. Dissemination of information about changes, relevant for the improvement of other instruction, is increased.

7. Investments of personnel time in planning change, and university resources in funding change, are more systematic and controlled, and therefore more appropriate.

DISCUSSION

The design of the System for Planned Change, and the conclusions drawn from this study and pilot project, are considered by those concerned with the project to be of value to The Ohio State University and to other institutions of higher education. However, it is realized that the evaluation of the System could not be either empirical or complete within the scope of this project. The project has served to begin the process of planned change in one course of instruction, and it seems that this exemplary program will continue. The program might be considered exemplary in terms of the system by which it was planned, and in terms of its innovative use of personnel, methods, and media.

Perhaps the result of the project which was most unexpected was the interest which was generated among those who were most concerned. It seems that the project stimulated the professional development of these people as they were given a chance to ask questions and discuss situations, conditions, and concepts in a realistic situation. It was a chance to apply theory to practice.

This serendipity is considered to be of considerable value in the in-service professional growth of the University staff involved in the planned change project.

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

It is concluded that the proposed System for Planned Change is of value in planning and bringing about planned change in the curricula of institutions of higher education. Systematic planning of this type seems to be of value in the development of innovative programs, and in providing a natural setting for professional growth of the people involved.

The results of this project appear to imply that many teachers who have claimed to be too busy to innovate will develop much enthusiasm for change if they are provided with certain types of assistance. Administrators are not only "gatekeepers" of change, but are the servants of the change process. They must provide support if change is to be economically ordered rather than haphazard.

It is recommended that The Ohio State University, and other institutions of higher education, consider the establishment of some system for supporting planned change, with similar characteristics to the one described in this report. It is further recommended that this System be tried and evaluated in terms of the unique features of the institution concerned, and that continual revisions be made to overcome evident weaknesses. Failures may be due not to the use of a systems approach, but to specific design features of the system.

SUMMARY

This project proposed to study the process of planned change in society and, specifically, in education, in order to design and evaluate a system for planned curriculum change in institutions of higher education. The project recognized a need for some systematic process for assisting the university faculty member to plan and bring about innovations in his instructional programs. As new situations and conditions are imposed upon the instructional programs, the faculty is finding that old teaching methods are not appropriate. Yet, because of these same pressures, the faculty has little time, energy, or interest to systematically plan needed innovations. This project is an effort to provide university administrators with a system whereby assistance can be made

available to faculty members which will both encourage and support their efforts toward planned change.

A review was made of literature concerned with the change process, and a study was made of planned change activities in other institutions, in order to develop the suggested "System for Planned Change." The System was evaluated and revised through a Pilot Project which was carried out according to the process described in the System. The System included phases for identifying the problem situation and the people involved, for planning the curriculum to meet specific learner goals, for building the trial learning environment, for operationally testing the environment, and for dissemination of information about the innovation.

The evaluation of the proposed System for Planned Change, through the Pilot Project, indicated values of several types in the use of the System. Changes of a major nature were planned and carried out in an appropriate manner according to the System. Encouragement and assistance provided through the System was sufficient to stimulate the interest and creativity of the faculty involved. It was also apparent that the planning process served as a means for professional growth for the faculty.

It is recommended that institutions of higher education consider the use of a system for encouraging and supporting planned change, similar to the System for Planned Change developed in this project. It is further suggested that the process adopted be continually evaluated and revised to keep the process one that can most appropriately serve the planned change activities of the faculty.

BIBLIOGRAPHY

RESOURCE SUMMARY I

WHAT IS KNOWN ABOUT THE CHANGE PROCESS

Abbott, Max G., Change Perspectives in Educational Administration, The School of Education, Auburn University, Auburn, Alabama, 1965, 87pp.

Association for Supervision and Curriculum Development, NEA, Leadership for Improving Instruction, The Association, Washington, D.C., 1960, 198pp.

Barnett, H.G., Innovation--The Basis of Cultural Change, McGraw-Hill Publishing Company, New York, 1953, 462 pp.

Bennis, Warren G.; Benne, Kenneth D.; Chin, Robert, The Planning of Change--Readings in the Applied Behavioral Sciences, Holt, Rinehart & Winston, New York, 1961.

Blackman, Charles, The Process of Chan[illegible]-An Annotated Bibliography, prepared by members of a seminar in Curriculum development, College of Education, Michigan State University, 1963.

Blanke, Virgil E., and Bhola, Harbans S., A Report of the Conference on Strategies for Educational Change, The Ohio State University Research Foundation, Columbus, Ohio, 1966.

Blanke, Virgil E., The SEC Newsletter of the Conference on Strategies for Educational Change, Volume I, Issues 1-10, The Ohio State University, 1965-1966-1967.

Brickell, Henry M., Organizing New York State for Educational Change, The University of the State of New York State Education Department, Albany, 1961, 107 pp.

Burns & Stalker, The Management of Innovation, Humanities Press, Inc., 1961.

Carlson, Richard O., Adoption of Educational Innovations, The Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1965, 84 pp.

Carlson, Richard O., and others, Change Processes in the Public Schools, The Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1965, 92 pp.

Chin, Robert, General Strategies and Procedures in Effecting Change, prepared for a publication of the Conference on Strategies and Procedures in Planning an Effected Need Change in Education, Scottsdale, Arizona, 1967.

Clark, David L. and Guba, Egon G., Effecting Change in Institutions of Higher Education, a paper delivered at the U.C.E.A. International Inter-Visitation Conference, Columbus, Ohio, October, 1966.

Culbertson, Jack, Organizational Strategies for Planned Change in Education, prepared for the Conference on Strategies for Educational Change, Washington, D.C., 1965.

Fallon, Berlie J., editor, Educational Innovation in the United States, Phi Delta Kappa, Bloomington, Indiana, 1966.

Guba, Egon G., Methodological Strategies for Educational Change, a paper presented to the Conference on Strategies for Educational Change, Washington, D.C., 1965.

Hagstrom, Warren O., Organizational Factors Facilitating and Inhibiting the Acceptance of Innovations in Schools, Research and Development Center for Learning and Re-Education, University of Wisconsin, Madison, Wis.

Hartley, Harry J., Focus on Change and the School Administrator, The School of Education, The State University of New York at Buffalo, 1965, 86 pp.

Havelock, Ronald, and Benne, Kenneth, An Exploratory Analysis of Knowledge Utilization, Center for Research on the Utilization of Scientific Knowledge, The University of Michigan, October, 1965.

Heathers, Glen, The Strategy of Educational Reform, Experimental Teaching Center, New York University, School of Education, August 1963.

Hoffer, Eric, The Ordeal of Change, Harper & Bros., Inc., New York, 1963.

Kaser, Tom,"Idea: Prescription for Change,"reprinted from June 18, 1966 issue of Saturday Review, 380 Madison Avenue, New York.

Klausmeier, Herbert, and Goodson, Max, Project Models: Maximizing Opportunities for Development and Experimentation in Learning in the Schools, Occasional Paper #3, Research and Development Center for Learning and Re-Education, The University of Wisconsin, Madison, Wisconsin, 1966.

Leeper, Robert R., editor, Strategy for Curriculum Change, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 77 pp.

Lewin, Kurt, Field Theory and Social Science, Harper and Brothers, New York, 1951.

Lionberger, Herbert F., The Diffusion of Innovations with Applications from Agricultural Research to Implement a Change in School Systems, a paper presented at the Association for Supervision and Curriculum Development Seminar on Strategy for Curriculum Change, New Orleans, Louisiana, January, 1965.

Little, Arthur D., Management Factors Affecting Research and Exploratory Development, Defense Documentation Center, Defense Supply Agency, U.S. Department of Commerce, National Bureau of Standards Institute for Applied Technology, Unclassified.

Mial, Dorothy, The Tarrytown Conference on Educational Development, papers delivered at a Cooperative Project on Educational Development, National Training Laboratories, National Education Association, Washington.

Miles, Matthew B., Innovations in Education, Bureau of Publications, Teachers College, Columbia University, New York, 1964.

Miller, Richard I., The Perspectives on Educational Change, Meredith Publishing Company, New York, 1967, 392 pp.

Panel on Educational Research and Development, Innovation and Experiment in Education, The Panel, Washington, D.C., 1964, 79 pp.

"Planning for Educational Change," Theory Into Practice, Volume 5, #1, February, 1966, College of Education, The Ohio State University, Columbus, Ohio.

Schein, Edgar H., and Bennis, Warren C., Personal and Organizational Change Through Group Methods, John Wiley and Sons, Inc., New York, 1965.

Rogers, Everett M. and Smith, Latisha, Bibliography on Diffusion of Innovations, Diffusion of Innovations Research Report #3, Department of Communication, Michigan State University, East Lansing, Michigan, July, 1965.

Silberman, Charles E.,"Technology is Knocking at the Schoolhouse Door,"reprint from Fortune Magazine, August, 1966.

RESOURCE SUMMARY II

WHAT IS KNOWN ABOUT THE PLANNING PROCESSES

Benson, Charles, editor, Perspectives on the Economics of Education, Houghton Mifflin Company, Boston, 1963.

Berlo, David K., The Process of Communication, Holt, Rinehart & Winston, New York, 1960, 318 pp.

Egbert, Robert L., and Cogswell, John F., System Analysis and Design in Schools, Document Sp-1141, System Development Corporation, Santa Monica, March 1963.

Flagle, Charles D.; Huggins, William H.; and Roy, Robert H., editors, Operations Research and Systems Engineering, Johns Hopkins Press, Baltimore, 1960.

Fuller, Buckminster, Education Automation, University of Southern Illinois Press, 1962.

Gagne, Robert M., editor, Psychological Principles in System Development, Holt, Rinehart and Winston, Inc., New York, 1962.

Goode, H. H., and Machol, R.E., System Engineering, McGraw-Hill Book Co., Inc., New York, 1957.

Melching, William H., and others, The Text of an Orientation Workshop in Automated Instruction, Consulting Report, HumRRO Division No. 5 (Air Defense), Fort Bliss, Tex., July 1962.

Porter, E. H., The System Thinkers: Parable and Paradigm, SP-285, System Development Corporation, Santa Monica, 1961.

Stolurow, Lawrence M., Some Educational Problems and Prospects of a Systems Approach to Instruction, Technical Report No. 2, Training Research Laboratory, University of Illinois, Urbana, March 1964.

RESOURCE SUMMARY III

WHAT IS KNOWN ABOUT HOW LEARNING HAPPENS

Association for Supervision and Curriculum Development, NEA, Freeing Capacity to Learn, The Association, Washington, D.C., 1960, 96 pp.

Association for Supervision and Curriculum Development, NEA, Human Variability and Learning, The Association, Washington, D.C., 1961, 96 pp.

Berelson, Bernard, and Steiner, Gary A., Human Behavior: An Inventory of Scientific Findings, Harcourt, Brace and World, New York, 1964, 712 pp.

Bigge, Morris L., Learning Theories for Teachers, Harper & Row, New York, 1964, 366 pp.

Bloom, Benjamin S., Stability and Change in Human Characteristics, John Wiley & Sons, Inc., New York, 1964, 237 pp.

Bugelski, B.R., The Psychology of Learning Applied to Teaching, The Bobbs-Merrill Co., Inc., 1964, 278 pp.

Deese, James Earle, Principles of Psychology, Allyn and Bacon, Boston, 1964, 489 pp.

Department of Classroom Teachers and American Educational Research Association, What Research Says to the Teacher, National Education Association, Washington, D.C., 32 pp.

Gage, N.L., editor, Handbook of Research on Teaching, Rand McNally & Co., Chicago, 1963, 1,218 pp.

Gagne, Robert M., Conditions of Learning, Holt, Rinehart & Winston, New York, 1965.

Glaser, Robert, editor, Training Research and Education, Science Editions, John Wiley & Sons, Inc., New York, 1965, 596 pp.

Hilgard, Ernest R. and Bower, Gordon H., Theories of Learning, Appleton-Century-Crofts, New York, 1966, 661 pp.

Hilgard, Ernest R., editor, Theories of Learning and Instruction, Sixty-Third Yearbook of the National Society for the Study of Education, University of Chicago Press, Chicago, 1964, 430 pp.

Lorge, Irving, and others, Psychology of Adults, Adult Education Association of the USA, Washington, D.C., 1963, 30 pp.

Macdonald, James B. and Leeper, Robert R., editors, Theories of Instruction, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 118 pp.

Smith, Karl U. and Smith, Margaret Foltz, Cybernetic Principles of Learning and Educational Design, Holt, Rinehart and Winston, Inc., New York, 1966, 529 pp.

Smith, Louis M., and Hudgins, Bryce B., Educational Psychology, Alfred A. Knopf, New York, 1964, 533 pp.

Trow, William Clark, Teacher and Technology: New Designs for Learning, Appleton-Century-Crofts, New York, 1963,

Watson, Goodwin B., What Psychology Can We Trust?, Bureau of Publications, Teachers College, Columbia University, New York, 1961.

RESOURCE SUMMARY IV

WHAT IS KNOWN ABOUT CURRICULUM DESIGN

American Association of School Administrators, A Climate for Individuality, Statement of The Joint Project on the Individual and the School, The Association, Washington, D.C., 1965, 56 pp.

Association for Supervision and Curriculum Development, NEA, Individualizing Instruction, The Association, Washington, D.C., 1964 174 pp.

Association for Supervision and Curriculum Development, NEA, New Insights and the Curriculum: ASCD Yearbook, 1963, Alexander Frazier, editor, The Association,Washington, D.C., 1963.

Baskin, Samuel, editor, Higher Education: Some Newer Developments, McGraw-Hill Book Co., New York, 1965, 342 pp.

Beggs, David W., III, and Buffie, Edward G., Independent Study: Bold New Venture, Indiana University Press, Bloomington, Indiana, 1965, 236 pp.

Beggs, David W., III, Team Teaching: Bold New Venture, Unified College Press, Indianapolis, Indiana, 1964, 192 pp.

Bloom, Benjamin S.; Krathwohl, David R.; and Masia, Bertram B., Taxonomy of Educational Objectives, David McKay, New York, 1964, 196 pp.

Bruner, Jerome, The Process of Education, Harvard University Press, Cambridge, Mass., 1960, 97 pp.

Denemar, George W., Chairman & Editor, Criteria for Curriculum Decisions in Teacher Education, Association for Supervision and Curriculum Development, Washington, D. C., 1963, 58 pp.

Ford, G. W., and Pugno, Lawrence, editors, The Structure of Knowledge and the Curriculum, Rand McNally & Co., Chicago, 1964, 105 pp.

Goodlad, John I.; Von Stoephasius, Renata; and Klein, M. Frances, The Changing School Curriculum, The Fund for the Advancement of Education, New York, 1966, 122 pp.

Goodlad, John I., Some Propositions in Search of Schools, Department of Elementary School Principals, NEA, Washington, D. C., 1962, 32 pp.

Leeper, Robert R., editor, Strategy for Curriculum Change, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 77 pp.

Read, Edwin A., and Crnkovic, John K., The Continuous Progress Plan, Brigham Young University, Provo, Utah, 1963.

Taba, Hilda, Curriculum Development: Theory and Practice, Harcourt, Brace and World, New York, 1962, 529 pp.

RESOURCE SUMMARY V

WHAT IS KNOWN ABOUT MEDIA FOR LEARNING

American Educational Research Association, Review of Educational Research, The Association, Washington, D.C., 1962, 211 pp.

Arnstein, George E., Automation: The New Industrial Revolution, American Industrial Arts Association, Washington, D.C., 1964, 20 pp.

Brown, James W.; Lewis, Richard B.; and Harcleroad, Fred F., Audiovisual Instruction: Materials and Methods, McGraw-Hill, New York, 1964, 592 pp.

Brown, James W. and Norberg, Kenneth D., Administering Educational Media, McGraw-Hill Book Company, New York, 1965, 357 pp.

Brown, James W. and Thornton, James W. Jr., editors, New Media in Higher Education, Association for Higher Education and the Division of Audiovisual Instructional Service, NEA, Washington, D.C., 1963, 182 pp.

Bushnell, Donald, editor, The Automation of School Information Storage Systems, Department of Audiovisual Instruction, NEA, Washington, D.C., 1964.

Dale, Edgar, Audiovisual Methods in Teaching (Revised Edition), Dryden Press, New York, 1954.

De Grazia, Alfred and Sohn, David A., Revolution in Teaching: New Theory, Technology, and Curricula, Bantam Books, New York, 1964, 310 pp.

Diamond, Robert M., editor, A Guide to Instructional Television, McGraw-Hill Book Company, New York, 1964, 304 pp.

Educational Facilities Laboratories, New Building on Campus, Six Designs for a College Communications Center, a report from Educational Facilities Laboratories, New York, 1963.

Fattu, Nicholas A. and Elam, Stanley, editors, Simulation Models for Education, Fourth Annual Phi Delta Kappa Symposium on Educational RLsearch, Phi Delta Kappa, Bloomington, Indiana, 1965, 172 pp.

Finn, James D., Bolvin, Boyd M., and Perrin, Donald G., A Selective Bibliography on New Media and Instructional Technology, School of Education, University of Southern California, Los Angeles, April, 1964.

Ford Foundation and the Fund for the Advancement of Education, Teaching by Television, The Foundation, New York, 1961, 87 pp.

Gilbert, Thomas F., "Mathetics: The Technology of Education," Journal of Mathetics, Vol. 1, No. 1, January 1962.

Green, Alan C., editor, Educational Facilities with New Media, Department of Audiovisual Instruction, NEA, Washington, D. C., 1966, 209 pp.

Green, Edward J., The Learning Process and Programmed Instruction, Holt, Rinehart and Winston, Inc., New York, 1962.

Innovations for Time to Teach, Project: Time to Teach, Dept. of Classroom Teachers, NEA, Washington, D.C., 1966, 147 pp.

The Institute for Communication Research, New Teaching Aids for the American Classroom, The Institute, Stanford University, California, 1960, 173 pp.

Kinkade, R.G., and Kidd, J.S., The Use of an Operational Game as a Method of Task Familiarization, Technical Report 59-204, Aero Medical Laboratory, Wright Air Development Center, Wright-Patterson AFB, Ohio, July, 1959.

Lumsdaine, A.A., and Glaser, Robert, editors, Teaching Machines and Programmed Learning: A Source Book, Department of Audiovisual Instruction, NEA, Washington, D.C., 1960.

Lumsdaine, Arthur A., "Experimental Research on Instructional Devices and Materials," in Training Research and Education, Robert Glaser, editor, University of Pittsburgh Press, Pittsburgh, Pa., 1962.

Miller, Neal E., and others, Graphic Communication and the Crisis in Education, Audio-Visual Communication Review, Department of Audiovisual Instruction, NEA, Washington, D.C., 1957, 120 pp.

National Council on Schoolhouse Construction, Planning Facilities for Higher Education, The Council, 1960, 104 pp.

National School Public Relations Association, Technology in Education, Education U.S.A. Special Report, The Association, Washington, D.C., 1967, 24 pp.

Newer Educational Media, Papers of the Regional Research Conference, Pennsylvania State University, University Park, Pa., 1961, 104 pp.

Ofeish, G. D., and Meierhenry, W. C., editors, Trends in Programmed Instruction, Department of Audiovisual Instruction, National Education Association, and National Society for Programmed Instruction, Washington, D.C., 1964.

Popham, W. James, "Tape Recorded Lectures in the College Classroom," AV Communications Review, Vol. 10, No. 2 March-April 1961.

Postlethwait, S. N.; Novak, J.; and Murray, H., An Integrated Experience Approach to Learning With Emphasis on Independent Study. Burgess Publishing Company, Minneapolis, Minn., 1964, 114 pp.

Schramm, Wilbur, The Research on Programmed Instruction: An Annotated Bibliography, Bulletin No. 35 (OE-34034), Office of Education, U.S. Department of Health, Education and Welfare, Washington, D.C., 1964, 114 pp.

Stolurow, Lawrence M., Teaching by Machine, Cooperative Research Monograph No. 6 (OE-34010) Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C., 1961.

Taylor, Calvin W. and Williams, Frank E., editors, Instructional Media and Creativity, John Wiley and Sons, Inc., New York, 1966, 397 pp.

Trow, William Clark, The Teacher and Technology: New Designs for Learning, Appleton-Century-Crofts, 1963, 198 pp.

Trump, J. Lloyd, "Changing Concepts of Instruction and the School Library as a Materials Center," The School Library as a Materials Center, U.S. Government Printing Office, Washington, D. C., 1963.

APPENDIX I

A SYSTEM FOR PLANNED CHANGE IN HIGHER EDUCATION CURRICULUM

A SYSTEM FOR PLANNED CHANGE IN HIGHER EDUCATION CURRICULUM

ORGANIZATION

In order to fulfill the purposes stated on the preceeding page, this suggested "system" should be established in institutions of higher education in the office of the Vice-President of Instruction. The system should be administered by an organization which might be called the "Center for Curriculum Design," or some similar name. The "Center" should be directed by one who has considerable understanding of higher education curriculum and teaching, of the scientific approach to curriculum design processes, and of the application of technological methods and materials to the teaching-learning process. Project coordinators and clerical assistants should be added to his staff as necessary. Funds for project planning and trial should be directly available to the director in order to assure faculty of support for their change projects.

The "Center" need have no administrative authority beyond that to work directly and informally with the faculty in supporting change projects. It must pose no threats to any teaching or administrative staff. It must be free to serve as the director sees fit to fulfill its purposes.

A SYSTEM FOR PLANNED CHANGE

PERSONNEL

Center (or Office) for Curriculum Design

- Director
- Project Coordinators
  (One for each four projects)
- Office Manager and Secretary
- Clerical Assistants

Staff of Individual Curriculum Design Projects

- Primary Teacher
- Assistant Teachers
- Department Head
- Administration

Consultants (on call by appointment)

- Educational Psychologist
- Evaluation Specialist
- Curriculum Specialist
- Media Specialist
- Material Production Specialist
- Facilities Engineer

A SYSTEM FOR PLANNED CHANGE

PRELIMINARY PHASE

INPUT 

EXPRESSION OF NEED FOR CHANGE

This expression may come in many forms, either a clear request for assistance or a vague indication that things are not as they should be. Expressions may come unsolicited from faculty, students, or administration, or they may be sought out by planned surveys of various sorts. In any case, an unsatisfactory condition is recognized.

PREPARE STATEMENT OF THE PROBLEM

There must be a complete and concise description of the unsatisfactory condition, reasons why there is a need for change, and evident possible alternative directions for the change. The statement must include the probable scope of the change: the organizations, individuals and programs which will be affected, and the period of time likely to be involved. The statement must clearly define the "end," or goal, toward which the "means" are designed, and on which the evaluation of the change is based.

Get a commitment of interest and support from the Department Head.

Commit expenditures of time and funds for project planning.

A SYSTEM FOR PLANNED CHANGE

IDENTIFY PERSONNEL AND FUNCTIONS

Project Director: (Probably the primary teacher and subject matter specialist.) Makes major decisions in the project concerning other personnel functions, rate of development and change directions.

Project Coordinator: (From the Center office.) Suggests the "process" for the change, and provides support in the form of consultants, funds and arrangements on the administrative level.

Approving Officers: These are identified and kept informed of the project progress for quick approval at certain points.

Consulting Specialists: These are identified and commitments are obtained for scheduled planning consultation when necessary.

Inform all concerned personnel of plans for the change project.
Collect and analyze feedback.

A SYSTEM FOR PLANNED CHANGE

PLANNING PHASE

ESTABLISH LEARNER GOALS

Consider existing conditions affecting the change project

Specify:
General objectives
Content
Specific behavioral goals
Learner evaluation

Learner goals are specified on the basis of the stated need for the curriculum, the conditions within which the need exists and within which the learning is to take place, and the assumed nature of the learner. Goals must first be stated in general terms, and then made more specific until they state precisely what behavior must be eventually demonstrated by the learner. As they are developed from general to specific, the goals will specify the content of the curriculum and will indicate how the goal behavior is evaluated.

Get reactions and suggestions from all staff members to be affected by the project.

A SYSTEM FOR PLANNED CHANGE

PLAN CURRICULUM

Select Experiences

Learners will need certain kinds of experiences if they are to establish specific behavior. These experiences will concern the curriculum content and may include assimilating facts, relating facts, developing concepts, developing theory, and practicing skills.

Design Environment

Elements available for environment design include persons, materials, methods, equipment, and facilities. The design will include an arrangement of the elements in a time sequence. The environment must be designed to provide the required learning experiences in an economic and effective manner. Facts about sources, costs and availability of all elements must be stated.

Get all necessary approvals and secure required funds for building the learning environment.

Get reactions from all staff members to be affected by the project.

BUILDING PHASE

BUILD TRIAL LEARNING ENVIRONMENT

Build the trial learning environment following the design of the planning phase. Problems arising from the building can be expected to necessitate minor changes in the design.

SCHEDULE PERSONNEL

Make arrangements for all persons involved in the learning environment in terms of time, locations, and functions. These include the learners, teachers, assistants, and resource persons.

OBTAIN EQUIPMENT

Arrange to have equipment available and in operating condition when it is needed. This might include projection, audio recording and playback, television, laboratory and special purpose equipment.

ARRANGE MATERIALS

Procure, collect, produce, and arrange materials to be used by the teacher and the learner. Printed, graphic, projected, audio, and realia materials must be available when and where they are needed.

SCHEDULE FACILITIES

Build facilities, or if these already exist, schedule facilities for the learning experiences. These may include classrooms, for various groupings, laboratories, individual study areas, and audio and television systems.

Demonstrate the use of the prepared environment to all staff members concerned. Train and rehearse its use where necessary. Get approvals for the trial operation.

A SYSTEM FOR PLANNED CHANGE

TRIAL AND EVALUATION PHASE

Select learners
Schedule activities
Direct activities
Evaluate learning
Evaluate system
Revise environment
Re-trial

This phase should involve a group large enough to simulate the operational phase, and should consist of an entire cycle of the courses involved. This should not be an "experimental" phase, but a model of the intended operational phase. The evaluation of the system should be based on the opinions and responses of the students and teaching personnel involved. Revision and retrial should continue until, in the judgment of all concerned, the curriculum design is adequate to meet the stated needs.

Get the necessary approvals and funds for the design and building of the operational phase. Use the reactions of all personnel involved for this planning.

A SYSTEM FOR PLANNED CHANGE

OPERATIONAL PHASE

Plan and procure budget
Build operational environment
Schedule activities
Direct activities
Continually evaluate and revise

There will be problems in this full scale operation which did not exist in the trial phase. These should be worked out on the basis of the same theory used in the planning phase. Although this phase might be considered the final one in this change process, there should continue to be evaluation and revisions in the curriculum design due to changing external conditions.

DISSEMINATION PHASE

The dissemination of information about the change project does not make a contribution toward the project goal. However, knowledge of such a project will tend to emphasize unsatisfactory conditions in other areas, and to encourage the undertaking of similar change projects. A major function of the Center for Curriculum Design should be the exchange of information about specific change projects, as well as about new evidence of the change process itself.

APPENDIX II

THE BEGINNINGS OF A CHANGE PROJECT

THE BEGINNINGS OF A PILOT CHANGE PROJECT

Course:

Education 408, Introduction to the Study of Education (3 quarter hours credit, required of all Education students)

General Purpose:

To provide the aspiring teacher with a "frame of reference" with which he may judge compatability between the field of education and himself; to provide the student with an opportunity to survey the field of education and the profession of teaching; to provide the student with information for deciding whether or not he wants to pursue the profession, and a review of the experiences needed for the development of teaching competence.

General Methods of Instruction:

Approximately 2500 students scheduled this course during the 1966-67 school year. Enrollments in the Fall quarters reach one thousand students. Instruction has been provided primarily by one large group lecture per week and two small group (25 students) discussions. The large group lectures have been presented by selected members of the School of Education faculty, or by guest lecturers. The small group discussions, directed by graduate students, concern the content of the lectures, or of assigned readings.

Need for Change:

The faculty has indicated concern with the general inadequacy of the course. Deficiencies include (1) lack of continuity and basic structure; (2) lack of uniformity in the small group discussions; and (3) lack of individual student involvement (and interest) with the content. While the need for student orientation to the study of education remained obvious, it was clear that a more appropriate orientation called for the availability of different kinds of experiences.

This recognized need served as the "Input" for a project of planned change - and as a Pilot Project for the trial of a proposed "System for Planned Change" in higher education.

Organization:

The proposed "System" called for a "Center for Curriculum Design" to administer the support for the Change Project. A trial "Center," with its personnel, was established. The Center Director was the Director of the Office of Education Project, Dr. Thomas E. Miller, and his assistant, Mr. Edward Wallen, played the role of "Project Coordinator." The need for planned change was recognized, and the trial project began.

Preliminary Phase

As the School of Education faculty became generally concerned with the inadequacies of the course, Introduction to the Study of Education, the primary instructor, his assistants and the administrative staff of the School, made the decision that something should be done. There was consultation with the Director of the "Center for Curriculum Design." Inadequacies of the course were studied and a clear statement of need was developed. From this statement of need, a statement of the problem evolved. This included the probable scope of the problem and the goal of the change project. Finally, the personnel who would be involved in the change project were named, and their functions outlined. Personnel included:

Project Director	- Russell French (Primary Instructor)
Assistant Instructors	- Richard Gallagher and David Weiss
Department Head	- Frederick Cyphert (Approving Officer)
Consultants	- Members of the Faculty, School of Education

Educational Psychologist
Curriculum Specialist
Evaluation Specialist
Media Specialist
Materials Production Specialist
Facilities Engineer

Planning Phase

Learner goals were established. General objectives came from the statement of needs, then areas of content and specific behavioral goals grew out of the general objectives. Behavioral goals were developed for only some of the content areas before the process moved into other planned phases. Involved in the establishing of goals were the "Center" Director, Project Coordinator, Project Director (Primary Instructor), the Educational Psychologist and the Curriculum Specialist. The Evaluation Specialist was called in to help develop the learner evaluation.

For each behavioral goal, learner experiences were identified and the appropriate environment was planned. The Media Specialist helped with this planning. As was indicated by the scope of the project outlined in the preplanning phase, the experiences necessary to bring about the stated learner behavior included several types of interaction with information disseminators, and with concept critiques. The required environment included large group lectures, small group interaction, and/or individual study-interaction opportunities in a specially designed laboratory. These environments were designed, reactions of staff members concerned were considered, and approval of the final design was obtained from the Department Head. The necessary funding for materials, equipment and facilities was made available.

Building Phase

With the help of the Media Specialist, Materials Production Specialist, and Facilities Engineer, the trial learning environment was built. The major innovation of this environment consisted of an Individual Study Laboratory containing 32 study carrels. These were equipped with tape playback equipment and 35mm. slide and 8mm. motion picture projection equipment. A video tape recorder-playback system and 16mm. projection system were also available in the Laboratory. Materials were prepared for individual study in certain of the content areas. These included audio tapes, slides, motion pictures, video tapes, and a variety of printed materials. These were combined to provide specific types of interaction experiences.

Instructional personnel, students and facilities were scheduled for the Trial and Evaluation Phase. Students were given as much freedom as possible in the Individual Study Laboratory experiences. Final approval was given by the Department Head for the Trial Phase.

Trial and Evaluation Phase

The Trial Phase of this Pilot Project continued through the Fall and Winter Quarters of the 1966-1967 school year, and until the termination of this Office of Education Project on March 31, 1967. Only a portion of the total environment for the course could be developed furing this time, but the Pilot Change Project is continuing. Some evaluation of student progress in the new environment is being made for comparison with that of the old, but empirical results are not yet available. However, subjective opinions of the faculty and students concerned with the new environment, particularly that of the Independent Study Laboratory, are almost totally positive. It is expected that the Planning, Building, and Trial Phases of this Pilot Project will continue for several quarters, according to the suggested "System."

Operational Phase

It will be difficult to distinguish between the Trial Phase and the Operational Phase of change projects. It is expected that few new programs will ever become completely static - that is, never again needing study for revision. Certainly this Pilot Project, concerned as it is with an orientation to the now rapidly changing process of education, will continually need re-study and re-design. However, it is expected that within a few quarters the environment for the total content of this course will have been designed and tried at least once, and that some statistical data will be available for a more objective evaluation. This should mark the transition from the Trial to the Operational Phase.

Dissemination Phase

At this time it can only be conjectured that information about this planned change project - its conception, planning, design, trial, and indications of effectiveness - will be made available for study by others who may feel a need to plan change. Complete adoption of this course structure in other institutions seems unlikely, but a study of the planned change process used in this Pilot Project, and the innovative techniques of the project, should be helpful as background for other planned changes.

APPENDIX III

PLANNED CHANGE IN HIGHER EDUCATION DESIGN
(Pamphlet)

PLANNED CHANGE

IN HIGHER EDUCATION CURRICULUM DESIGN

PLANNED CHANGE

IN HIGHER EDUCATION CURRICULUM DESIGN

This pamphlet is prepared as a part of the final report of a project titled "Educational Media in Instructional Systems Development at Ohio State University", financed by a grant under provisions of Title VII of The National Defense Education Act of 1958 (PL 85-844).
Bureau of Research Project No. 5-1078
Contract No. OEC 3-6-051078-0605

Project Director, Thomas E. Miller
Associate Director, Frederick R. Cyphert
Research Assistant, Edward Wallen

1967
The Ohio State University

CONTENTS

INTRODUCTION

The purpose of this pamphlet is to suggest a plan for changing things. Things are going to change anyway--they always do. But if things are to be changed in a particular way or at a certain rate--in order to meet a specific need--then the change must be planned.

It is not easy to plan change--when you do not know how. There is so little change going on in institutions of higher education, particularly in the area of curriculum design, that there must be few faculty members who know how to plan for the changes which are so obviously needed.

The suggestion in this pamphlet is for planning change where change is needed in the curriculum of higher education: change in content, methods, teacher roles, materials and facilities. The purpose of such change should be to facilitate learning, which is itself a planned change process.

The plan which is illustrated here is for a "system" for stimulating, encouraging and supporting planned change in institutions of higher education. The suggestion is addressed to administrators who might provide such a support system for their faculty. The structure of the plan is based on what is known about the change process in a social context, in education in particular, and on a realization of the conditions which exist in higher education.

An in-depth theoretical study of the change process would be most helpful to those who are to plan change in higher education. This pamphlet may serve as a guide for such a study. More importantly--for those who cannot make such a study--this pamphlet contains the basic concepts of the change process as it relates to higher education, and suggests enough answers to make the planning of change a less threatening task for the faculty.

REASONS FOR CHANGE IN HIGHER EDUCATION

Change is always the result of an unsatisfied condition. The degree of this dissatisfaction--along with the quantity and nature of elements available for bringing about change--determines the rate of the change.

There are many "unsatisfied conditions" in the curricula of higher education. Basic causes of these include:

Expanded enrollments - A larger portion of the population are attending colleges, and for a longer period of time.

Expanding knowledge - More is known about more, and as knowledge expands, we must learn how to continue learning.

More complex society - It was once easy to be a "good" citizen; to respond to every phase of social activity. Now even the scholar finds this impossible.

Changing role of education - Scholarship is no longer sufficient; education is now preparation for Social Living.

The degree of dissatisfaction is high. And there have never been more social and technical "elements" available to support change. These are reasons to expect more change in higher education curricula, and change at an increasing rate.

In 1935, Samuel Eliot Morison suggested educational goals:

> Children must learn to read the Bible, that they might know God's truth, and to write and cipher, as an aid to honest living; chosen boys must be taught the learned language in which the world's best thought and literature were still to be found; and a smaller selection of youths must be given university training, in order to furnish the State with competent rulers, the Church with a learned Clergy, and society with cultured men.[1]

Albert Einstein once said: "It is nothing short of a miracle that modern methods of instruction have not yet entirely strangled the holy curiosity of inquiry." The danger to that "holy curiosity" comes not so much from bad teachers as from a rigid system of instruction that attempts to satisfy curiosity only at a particular time, in a particular place, and in a particular way. The joy that should come from the satisfaction of intellectual hunger is too often lost in a system of higher education which too often insists that in order to learn, students must sit in classes for a set number of hours over a set number of weeks. Education comes in "packages," and while the size of the package may vary from two or three credit hours to five credit hours, credit for learning and learning itself are assumed to bear a close relationship to the number of hours a student sits in the college classroom.[2]

The philosophy of the first third of this century is not appropriate for the last third--nor are the teaching methods. These are reasons for change.

---

[1]Samuel Eliot Morison, The Founding of Harvard College, Harvard University Press, Cambridge, Mass., 1935, p. 150.

[2]Dearing, Bruce, "The Student on His Own: Independent Study," in Higher Education: Some Newer Developments, pp. 49, 50, edited by Samuel Baskin, McGraw-Hill Book Company, New York, 1965.

REASONS FOR PLANNED CHANGE

Change is inevitable. The rate of change is largely set by existing conditions but can be controlled to a limited degree. However, the direction of change is within the hand of man. No other animal has this unique ability to plan the direction toward which it will change. Man, having this ability, is continuously learning to use it more effectively.

These are reasons why man's change is expected to be less haphazard, therefore less hazardous. Man plans change--and he learns.

Changes in higher education curriculum are appropriately planned when change decisions are based on:

What is known about the change process in general society and, particularly, in education.
(See Resource Summary I)

What is known about planning processes - about a "systems" approach to planning change.
(See Resource Summary II)

What is known about how learning happens, the contributions of psychology in general and educational psychology in particular.
(See Resource Summary III)

What is known about curriculum design in higher education, identifying needs, developing learning objectives, designing learning environment, evaluating learner behavior.
(See Resource Summary IV)

What is known about media for learning, the availability and effective use of methods, materials, people, equipment and facilities.
(See Resource Summary V)

REASONS CHANGE HAS BEEN SLOW

Although there has been much obvious need for improvements in the curriculum of higher education, changes have come about slowly. These changes have been largely inadequately planned. Some of the major reasons for this lack of planned change are:

Vague concepts of "professional freedom" deters administrative evaluation of learning, hierarchical pressure for change, and even communication between peer faculty, which would normally stimulate change.

Changes in a well developed but "static" course or curriculum is expensive and uneconomical for individual faculty members who have chosen to be creative in other areas.

Faculty teaching loads are so heavy that there is no time, energy or funds for anything but "keeping heads above water."

Few faculty members understand the process of curriculum change, and do not have available the "expertise" in several areas to assist in planning or bringing about change.

There is generally poor climate for change. Administrators - who are the "gate-keepers" of curriculum change - hesitate to provide the stimulus and support of change, in terms of readily available process (too much red tape), release faculty planning time, consulting personnel and funds for materials and facilities.

REASONS FOR A "SYSTEM" FOR PLANNING CHANGE

The system for planning change, described on the following pages, is designed to provide an adequate climate for change. Its purposes are to:

Stimulate thinking about change by recognizing and rewarding creativity in curriculum design.

Open communication channels for information about curriculum changes.

Set up a "service" center to provide leadership, coordination and consulting specialists for curriculum change planning, making it as easy as possible for individual faculty members to plan curriculum changes.

Make adequate funds available for the planning and trial of curriculum change, including funds for personnel, materials, equipment and facilities.

Provide some coordination of curriculum planning throughout the institution, particularly for common support services and facilities.

Suggest a flexible "process" for curriculum change.

A SYSTEM FOR PLANNED CHANGE IN HIGHER EDUCATION CURRICULUM

ORGANIZATION

In order to fulfill the purposes stated on the preceeding page, this suggested "system" should be established in institutions of higher education in the office of the Vice-President of Instruction. The system should be administered by an organization which might be called the "Center for Curriculum Design," or some similar name. The "Center" should be directed by one who has considerable understanding of higher education curriculum and teaching, of the scientific approach to curriculum design processes, and of the application of technological methods and materials to the teaching-learning process. Project coordinators and clerical assistants should be added to his staff as necessary. Funds for project planning and trial should be directly available to the director in order to assure faculty of support for their change projects.

The "Center" need have no administrative authority beyond that to work directly and informally with the faculty in supporting change projects. It must pose no threats to any teaching or administrative staff. It must be free to serve as the director sees fit to fulfill its purposes.

PERSONNEL

Center (or Office) for Curriculum Design

- Director
- Project Coordinators
  (One for each four projects)
- Office Manager and Secretary
- Clerical Assistants

Staff of Individual Curriculum Design Projects

- Primary Teacher
- Assistant Teachers
- Department Head
- Administration

Consultants (on call by appointment)

- Educational Psychologist
- Evaluation Specialist
- Curriculum Specialist
- Media Specialist
- Material Production Specialist
- Facilities Engineer

A SYSTEM FOR PLANNED CHANGE

PRELIMINARY PHASE

INPUT

EXPRESSION OF NEED FOR CHANGE

This expression may come in many forms, either a clear request for assistance or a vague indication that things are not as they should be. Expressions may come unsolicited from faculty, students, or administration, or they may be sought out by planned surveys of various sorts. In any case, an unsatisfactory condition is recognized.

PREPARE STATEMENT OF THE PROBLEM

There must be a complete and concise description of the unsatisfactory condition, reasons why there is a need for change, and evident possible alternative directions for the change. The statement must include the probable scope of the change: the organizations, individuals and programs which will be affected, and the period of time likely to be involved. The statement must clearly define the "end," or goal, toward which the "means" are designed, and on which the evaluation of the change is based.

Get a commitment of interest and support from the Department Head.

Commit expenditures of time and funds for project planning.

A SYSTEM FOR PLANNED CHANGE

IDENTIFY PERSONNEL AND FUNCTIONS

Project Director: (Probably the primary teacher and subject matter specialist.) Makes major decisions in the project concerning other personnel functions, rate of development and change directions.

Project Coordinator: (From the Center office.) Suggests the "process" for the change, and provides support in the form of consultants, funds and arrangements on the administrative level.

Approving Officers: These are identified and kept informed of the project progress for quick approval at certain points.

Consulting Specialists: These are identified and commitments are obtained for scheduled planning consultation when necessary.

Inform all concerned personnel of plans for the change project. Collect and analyze feedback.

A SYSTEM FOR PLANNED CHANGE

PLANNING PHASE

ESTABLISH LEARNER GOALS

Consider existing conditions affecting the change project

Specify:
General objectives
Content
Specific behavioral goals
Learner evaluation

Learner goals are specified on the basis of the stated need for the curriculum, the conditions within which the need exists and within which the learning is to take place, and the assumed nature of the learner. Goals must first be stated in general terms, and then made more specific until they state precisely what behavior must be eventually demonstrated by the learner. As they are developed from general to specific, the goals will specify the content of the curriculum and will indicate how the goal behavior is evaluated.

Get reactions and suggestions from all staff members to be affected by the project.

PLAN CURRICULUM

Select Experiences

Learners will need certain kinds of experiences if they are to establish specific behavior. These experiences will concern the curriculum content and may include assimilating facts, relating facts, developing concepts, developing theory, and practicing skills.

Design Environment

Elements available for environment design include persons, materials, methods, equipment, and facilities. The design will include an arrangement of the elements in a time sequence. The environment must be designed to provide the required learning experiences in an economic and effective manner. Facts about sources, costs and availability of all elements must be stated.

Get all necessary approvals and secure required funds for building the learning environment.

Get reactions from all staff members to be affected by the project.

BUILDING PHASE

BUILD TRIAL LEARNING ENVIRONMENT

Build the trial learning environment following the design of the planning phase. Problems arising from the building can be expected to necessitate minor changes in the design.

SCHEDULE PERSONNEL

Make arrangements for all persons involved in the learning environment in terms of time, locations, and functions. These include the learners, teachers, assistants, and resource persons.

OBTAIN EQUIPMENT

Arrange to have equipment available and in operating condition when it is needed. This might include projection, audio recording and playback, television, laboratory and special purpose equipment.

ARRANGE MATERIALS

Procure, collect, produce, and arrange materials to be used by the teacher and the learner. Printed, graphic, projected, audio, and realia materials must be available when and where they are needed.

SCHEDULE FACILITIES

Build facilities, or if these already exist, schedule facilities for the learning experiences. These may include classrooms, for various groupings, laboratories, individual study areas, and audio and television systems.

Demonstrate the use of the prepared environment to all staff members concerned. Train and rehearse its use where necessary. Get approvals for the trial operation.

A SYSTEM FOR PLANNED CHANGE

TRIAL AND EVALUATION PHASE

Select learners
Schedule activities
Direct activities
Evaluate learning
Evaluate system
Revise environment
Re-trial

This phase should involve a group large enough to simulate the operational phase, and should consist of an entire cycle of the courses involved. This should not be an "experimental" phase, but a model of the intended operational phase. The evaluation of the system should be based on the opinions and responses of the students and teaching personnel involved. Revision and retrial should continue until, in the judgment of all concerned, the curriculum design is adequate to meet the stated needs.

Get the necessary approvals and funds for the design and building of the operational phase. Use the reactions of all personnel involved for this planning.

DISSEMINATION PHASE

The dissemination of information about the change project does not make a contribution toward the project goal. However, knowledge of such a project will tend to emphasize unsatisfactory conditions in other areas, and to encourage the undertaking of similar change projects. A major function of the Center for Curriculum Design should be the exchange of information about specific change projects, as well as about new evidence of the change process itself.

THE BEGINNINGS OF A PILOT CHANGE PROJECT

Course:

Education 408, Introduction to the Study of Education (3 quarter hours credit, required of all Education students)

General Purpose:

To provide the aspiring teacher with a "frame of reference" with which he may judge compatability between the field of education and himself; to provide the student with an opportunity to survey the field of education and the profession of teaching; to provide the student with information for deciding whether or not he wants to pursue the profession, and a review of the experiences needed for the development of teaching competence.

General Methods of Instruction:

Approximately 2500 students scheduled this course during the 1966-67 school year. Enrollments in the Fall quarters reach one thousand students. Instruction has been provided primarily by one large group lecture per week and two small group (25 students) discussions. The large group lectures have been presented by selected members of the School of Education faculty, or by guest lecturers. The small group discussions, directed by graduate students, concern the content of the lectures, or of assigned readings.

Need for Change:

The faculty has indicated concern with the general inadequacy of the course. Deficiencies include (1) lack of continuity and basic structure; (2) lack of uniformity in the small group discussions; and (3) lack of individual student involvement (and interest) with the content. While the need for student orientation to the study of education remained obvious, it was clear that a more appropriate orientation called for the availability of different kinds of experiences.

This recognized need served as the "Input" for a project of planned change - and as a Pilot Project for the trial of a proposed "System for Planned Change" in higher education.

Organization:

The proposed "System" called for a "Center for Curriculum Design" to administer the support for the Change Project. A trial "Center," with its personnel, was established. The Center Director was the Director of the Office of Education Project, Dr. Thomas E. Miller, and his assistant, Mr. Edward Wallen, played the role of "Project Coordinator." The need for planned change was recognized, and the trial project began.

Preliminary Phase

As the School of Education faculty became generally concerned with the inadequacies of the course, Introduction to the Study of Education, the primary instructor, his assistants and the administrative staff of the School, made the decision that something should be done. There was consultation with the Director of the "Center for Curriculum Design." Inadequacies of the course were studied and a clear statement of need was developed. From this statement of need, a statement of the problem evolved. This included the probable scope of the problem and the goal of the change project. Finally, the personnel who would be involved in the change project were named, and their functions outlined. Personnel included:

Project Director	- Russell French (Primary Instructor)
Assistant Instructors	- Richard Gallagher and David Weiss
Department Head	- Frederick Cyphert (Approving Officer)
Consultants	- Members of the Faculty, School of Education

Educational Psychologist
Curriculum Specialist
Evaluation Specialist
Media Specialist
Materials Production Specialist
Facilities Engineer

Planning Phase

Learner goals were established. General objectives came from the statement of needs, then areas of content and specific behavioral goals grew out of the general objectives. Behavioral goals were developed for only some of the content areas before the process moved into other planned phases. Involved in the establishing of goals were the "Center" Director, Project Coordinator, Project Director (Primary Instructor), the Educational Psychologist and the Curriculum Specialist. The Evaluation Specialist was called in to help develop the learner evaluation.

For each behavioral goal, learner experiences were identified and the appropriate environment was planned. The Media Specialist helped with this planning. As was indicated by the scope of the project outlined in the preplanning phase, the experiences necessary to bring about the stated learner behavior included several types of interaction with information disseminators, and with concept critiques. The required environment included large group lectures, small group interaction, and/or individual study-interaction opportunities in a specially designed laboratory. These environments were designed, reactions of staff members concerned were considered, and approval of the final design was obtained from the Department Head. The necessary funding for materials, equipment and facilities was made available.

Building Phase

With the help of the Media Specialist, Materials Production Specialist, and Facilities Engineer, the trial learning environment was built. The major innovation of this environment consisted of an Individual Study Laboratory containing 32 study carrels. These were equipped with tape playback equipment and 35mm. slide and 8mm. motion picture projection equipment. A video tape recorder-playback system and 16mm. projection system were also available in the Laboratory. Materials were prepared for individual study in certain of the content areas. These included audio tapes, slides, motion pictures, video tapes, and a variety of printed materials. These were combined to provide specific types of interaction experiences.

Instructional personnel, students and facilities were scheduled for the Trial and Evaluation Phase. Students were given as much freedom as possible in the Individual Study Laboratory experiences. Final approval was given by the Department Head for the Trial Phase.

Trial and Evaluation Phase

The Trial Phase of this Pilot Project continued through the Fall and Winter Quarters of the 1966-1967 school year, and until the termination of this Office of Education Project on March 31, 1967. Only a portion of the total environment for the course could be developed furing this time, but tne Pilot Change Project is continuing. Some evaluation of student progress in the new environment is being made for comparison with that of the old, but empirical results are not yet available. However, subjective opinions of the faculty and students concerned with the new environment, particularly that of the Independent Study Laboratory, are almost totally positive. It is expected that the Planning, Building, and Trial Phases of this Pilot Project will continue for several quarters, according to the suggested "System."

Operational Phase

It will be difficult to distinguish between the Trial Phase and the Operational Phase of change projects. It is expected that few new programs will ever become completely static - that is, never again needing study for revision. Certainly this Pilot Project, concerned as it is with an orientation to the now rapidly changing process of education, will continually need re-study and re-design. However, it is expected that within a few quarters the environment for the total content of this course will have been designed and tried at least once, and that some statistical data will be available for a more objective evaluation. This should mark the transition from the Trial to the Operational Phase.

Dissemination Phase

At this time it can only be conjectured that information about this planned change project - its conception, planning, design, trial, and indications of effectiveness - will be made available for study by others who may feel a need to plan change. Complete adoption of this course structure in other institutions seems unlikely, but a study of the planned change process used in this Pilot Project, and the innovative techniques of the project, should be helpful as background for other planned changes.

RESOURCE SUMMARY I

WHAT IS KNOWN ABOUT THE CHANGE PROCESS

Abbott, Max G., Change Perspectives in Educational Administration, The School of Education, Auburn University, Auburn, Alabama, 1965, 87pp.

Association for Supervision and Curriculum Development, NEA, Leadership for Improving Instruction, The Association, Washington, D.C., 1960, 198pp.

Barnett, H.G., Innovation--The Basis of Cultural Change, McGraw-Hill Publishing Company, New York, 1953, 462 pp.

Bennis, Warren G.; Benne, Kenneth D.; Chin, Robert, The Planning of Change--Readings in the Applied Behavioral Sciences, Holt, Rinehart & Winston, New York, 1961.

Blackman, Charles, The Process of Change--An Annotated Bibliography, prepared by members of a seminar in Curriculum development, College of Education, Michigan State University, 1963.

Blanke, Virgil E., and Bhola, Harbans S., A Report of the Conference on Strategies for Educational Change, The Ohio State University Research Foundation, Columbus, Ohio, 1966.

Blanke, Virgil E., The SEC Newsletter of the Conference on Strategies for Educational Change, Volume I, Issues 1-10, The Ohio State University, 1965-1966-1967.

Brickell, Henry M., Organizing New York State for Educational Change, The University of the State of New York State Education Department, Albany, 1961, 107 pp.

Burns & Stalker, The Management of Innovation, Humanities Press, Inc., 1961.

Carlson, Richard O., Adoption of Educational Innovations, The Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1965, 84 pp.

Carlson, Richard O., and others, Change Processes in the Public Schools, The Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1965, 92 pp.

Chin, Robert, General Strategies and Procedures in Effecting Change, prepared for a publication of the Conference on Strategies and Procedures in Planning an Effected Need Change in Education, Scottsdale, Arizona, 1967.

Clark, David L. and Guba, Egon G., Effecting Change in Institutions of Higher Education, a paper delivered at the U.C.E.A. International Inter-Visitation Conference, Columbus, Ohio, October, 1966.

Culbertson, Jack, Organizational Strategies for Planned Change in Education, prepared for the Conference on Strategies for Educational Change, Washington, D.C., 1965.

Fallon, Berlie J., editor, Educational Innovation in the United States, Phi Delta Kappa, Bloomington, Indiana, 1966.

Guba, Egon G., Methodological Strategies for Educational Change, a paper presented to the Conference on Strategies for Educational Change, Washington, D.C., 1965.

Hagstrom, Warren O., Organizational Factors Facilitating and Inhibiting the Acceptance of Innovations in Schools, Research and Development Center for Learning and Re-Education, University of Wisconsin, Madison, Wis.

Hartley, Harry J., Focus on Change and the School Administrator, The School of Education, The State University of New York at Buffalo, 1965, 86 pp.

Havelock, Ronald, and Benne, Kenneth, An Exploratory Analysis of Knowledge Utilization, Center for Research on the Utilization of Scientific Knowledge, The University of Michigan, October, 1965.

Heathers, Glen, The Strategy of Educational Reform, Experimental Teaching Center, New York University, School of Education, August 1963.

Hoffer, Eric, The Ordeal of Change, Harper & Bros., Inc., New York, 1963.

Kaser, Tom,"Idea: Prescription for Change,"reprinted from June 18, 1966 issue of Saturday Review, 380 Madison Avenue, New York.

Klausmeier, Herbert, and Goodson, Max, Project Models: Maximizing Opportunities for Development and Experimentation in Learning in the Schools, Occasional Paper #3, Research and Development Center for Learning and Re-Education, The University of Wisconsin, Madison, Wisconsin, 1966.

Leeper, Robert R., editor, Strategy for Curriculum Change, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 77 pp.

Lewin, Kurt, Field Theory and Social Science, Harper and Brothers, New York, 1951.

Lionberger, Herbert F., The Diffusion of Innovations with Applications from Agricultural Research to Implement a Change in School Systems, a paper presented at the Association for Supervision and Curriculum Development Seminar on Strategy for Curriculum Change, New Orleans, Louisiana, January, 1965.

Little, Arthur D., Management Factors Affecting Research and Exploratory Development, Defense Documentation Center, Defense Supply Agency, U.S. Department of Commerce, National Bureau of Standards Institute for Applied Technology, Unclassified.

Mial, Dorothy, The Tarrytown Conference on Educational Development, papers delivered at a Cooperative Project on Educational Development, National Training Laboratories, National Education Association, Washington.

Miles, Matthew B., Innovations in Education, Bureau of Publications, Teachers College, Columbia University, New York, 1964.

Miller, Richard I., The Perspectives on Educational Change, Meredith Publishing Company, New York, 1967, 392 pp.

Panel on Educational Research and Development, Innovation and Experiment in Education, The Panel, Washington, D.C., 1964, 79 pp.

"Planning for Educational Change," Theory Into Practice, Volume 5, #1, February, 1966, College of Education, The Ohio State University, Columbus, Ohio.

Schein, Edgar H., and Bennis, Warren C., Personal and Organizational Change Through Group Methods, John Wiley and Sons, Inc., New York, 1965.

Rogers, Everett M. and Smith, Latisha, Bibliography on Diffusion of Innovations, Diffusion of Innovations Research Report #3, Department of Communication, Michigan State University, East Lansing, Michigan, July, 1965.

Silberman, Charles E.,"Technology is Knocking at the Schoolhouse Door,"reprint from Fortune Magazine, August, 1966.

RESOURCE SUMMARY II

WHAT IS KNOWN ABOUT THE PLANNING PROCESSES

Benson, Charles, editor, Perspectives on the Economics of Education, Houghton Mifflin Company, Boston, 1963.

Berlo, David K., The Process of Communication, Holt, Rinehart & Winston, New York, 1960, 318 pp.

Egbert, Robert L., and Cogswell, John F., System Analysis and Design in Schools, Document Sp-1141, System Development Corporation, Santa Monica, March 1963.

Flagle, Charles D.; Huggins, William H.; and Roy, Robert H., editors, Operations Research and Systems Engineering, Johns Hopkins Press, Baltimore, 1960.

Fuller, Buckminster, Education Automation, University of Southern Illinois Press, 1962.

Gagne, Robert M., editor, Psychological Principles in System Development, Holt, Rinehart and Winston, Inc., New York, 1962.

Goode, H. H., and Machol, R.E., System Engineering, McGraw-Hill Book Co., Inc., New York, 1957.

Melching, William H., and others, The Text of an Orientation Workshop in Automated Instruction, Consulting Report, HumRRO Division No. 5 (Air Defense), Fort Bliss, Tex., July 1962.

Porter, E. H., The System Thinkers: Parable and Paradigm, SP-285, System Development Corporation, Santa Monica, 1961.

Stolurow, Lawrence M., Some Educational Problems and Prospects of a Systems Approach to Instruction, Technical Report No. 2, Training Research Laboratory, University of Illinois, Urbana, March 1964.

RESOURCE SUMMARY III

WHAT IS KNOWN ABOUT HOW LEARNING HAPPENS

Association for Supervision and Curriculum Development, NEA, Freeing Capacity to Learn, The Association, Washington, D.C., 1960, 96 pp.

Association for Supervision and Curriculum Development, NEA, Human Variability and Learning, The Association, Washington, D.C., 1961, 96 pp.

Berelson, Bernard, and Steiner, Gary A., Human Behavior: An Inventory of Scientific Findings, Harcourt, Brace and World, New York, 1964, 712 pp.

Bigge, Morris L., Learning Theories for Teachers, Harper & Row, New York, 1964, 366 pp.

Bloom, Benjamin S., Stability and Change in Human Characteristics, John Wiley & Sons, Inc., New York, 1964, 237 pp.

Bugelski, B.R., The Psychology of Learning Applied to Teaching, The Bobbs-Merrill Co., Inc., 1964, 278 pp.

Deese, James Earle, Principles of Psychology, Allyn and Bacon, Boston, 1964, 489 pp.

Department of Classroom Teachers and American Educational Research Association, What Research Says to the Teacher, National Education Association, Washington, D.C., 32 pp.

Gage, N.L., editor, Handbook of Research on Teaching, Rand McNally & Co., Chicago, 1963, 1,218 pp.

Gagne, Robert M., Conditions of Learning, Holt, Rinehart & Winston, New York, 1965.

Glaser, Robert, editor, Training Research and Education, Science Editions, John Wiley & Sons, Inc., New York, 1965, 596 pp.

Hilgard, Ernest R. and Bower, Gordon H., Theories of Learning, Appleton-Century-Crofts, New York, 1966, 661 pp.

Hilgard, Ernest R., editor, Theories of Learning and Instruction, Sixty-Third Yearbook of the National Society for the Study of Education, University of Chicago Press, Chicago, 1964, 430 pp.

Lorge, Irving, and others, Psychology of Adults, Adult Education Association of the USA, Washington, D.C., 1963, 30 pp.

Macdonald, James B. and Leeper, Robert R., editors, Theories of Instruction, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 118 pp.

Smith, Karl U. and Smith, Margaret Foltz, Cybernetic Principles of Learning and Educational Design, Holt, Rinehart and Winston, Inc., New York, 1966, 529 pp.

Smith, Louis M., and Hudgins, Bryce B., Educational Psychology, Alfred A. Knopf, New York, 1964, 533 pp.

Trow, William Clark, Teacher and Technology: New Designs for Learning, Appleton-Century-Crofts, New York, 1963,

Watson, Goodwin B., What Psychology Can We Trust?, Bureau of Publications, Teachers College, Columbia University, New York, 1961.

RESOURCE SUMMARY IV

WHAT IS KNOWN ABOUT CURRICULUM DESIGN

American Association of School Administrators, A Climate for Individuality, Statement of The Joint Project on the Individual and the School, The Association, Washington, D.C., 1965, 56 pp.

Association for Supervision and Curriculum Development, NEA, Individualizing Instruction, The Association, Washington, D.C., 1964, 174 pp.

Association for Supervision and Curriculum Development, NEA, New Insights and the Curriculum: ASCD Yearbook, 1963, Alexander Frazier, editor, The Association, Washington, D.C., 1963.

Baskin, Samuel, editor, Higher Education: Some Newer Developments, McGraw-Hill Book Co., New York, 1965, 342 pp.

Beggs, David W., III, and Buffie, Edward G., Independent Study: Bold New Venture, Indiana University Press, Bloomington, Indiana, 1965, 236 pp.

Beggs, David W., III, Team Teaching: Bold New Venture, Unified College Press, Indianapolis, Indiana, 1964, 192 pp.

Bloom, Benjamin S.; Krathwohl, David R.; and Masia, Bertram B., Taxonomy of Educational Objectives, David McKay, New York, 1964, 196 pp.

Bruner, Jerome, The Process of Education, Harvard University Press, Cambridge, Mass., 1960, 97 pp.

Denemar, George W., Chairman & Editor, Criteria for Curriculum Decisions in Teacher Education, Association for Supervision and Curriculum Development, Washington, D. C., 1963, 58 pp.

Ford, G. W., and Pugno, Lawrence, editors, The Structure of Knowledge and the Curriculum, Rand McNally & Co., Chicago, 1964, 105 pp.

Goodlad, John I.; Von Stoephasius, Renata; and Klein, M. Frances, The Changing School Curriculum, The Fund for the Advancement of Education, New York, 1966, 122 pp.

Goodlad, John I., Some Propositions in Search of Schools, Department of Elementary School Principals, NEA, Washington, D. C., 1962, 32 pp.

Leeper, Robert R., editor, Strategy for Curriculum Change, Association for Supervision and Curriculum Development, Washington, D.C., 1965, 77 pp.

Read, Edwin A., and Crnkovic, John K., The Continuous Progress Plan, Brigham Young University, Provo, Utah, 1963.

Taba, Hilda, Curriculum Development: Theory and Practice, Harcourt, Brace and World, New York, 1962, 529 pp.

RESOURCE SUMMARY V

WHAT IS KNOWN ABOUT MEDIA FOR LEARNING

American Educational Research Association, Review of Educational Research, The Association, Washington, D.C., 1962, 211 pp.

Arnstein, George E., Automation: The New Industrial Revolution, American Industrial Arts Association, Washington, D.C., 1964, 20 pp.

Brown, James W.; Lewis, Richard B.; and Harcleroad, Fred F., Audiovisual Instruction: Materials and Methods, McGraw-Hill, New York, 1964, 592 pp.

Brown, James W. and Norberg, Kenneth D., Administering Educational Media, McGraw-Hill Book Company, New York, 1965, 357 pp.

Brown, James W. and Thornton, James W. Jr., editors, New Media in Higher Education, Association for Higher Education and the Division of Audiovisual Instructional Service, NEA, Washington, D.C., 1963, 182 pp.

Bushnell, Donald, editor, The Automation of School Information Storage Systems, Department of Audiovisual Instruction, NEA, Washington, D.C., 1964.

Dale, Edgar, Audiovisual Methods in Teaching (Revised Edition), Dryden Press, New York, 1954.

De Grazia, Alfred and Sohn, David A., Revolution in Teaching: New Theory, Technology, and Curricula, Bantam Books, New York, 1964, 310 pp.

Diamond, Robert M., editor, A Guide to Instructional Television, McGraw-Hill Book Company, New York, 1964, 304 pp.

Educational Facilities Laboratories, New Building on Campus, Six Designs for a College Communications Center, a report from Educational Facilities Laboratories, New York, 1963.

Fattu, Nicholas A. and Elam, Stanley, editors, Simulation Models for Education, Fourth Annual Phi Delta Kappa Symposium on Educational RLsearch, Phi Delta Kappa, Bloomington, Indiana, 1965, 172 pp.

Finn, James D., Bolvin, Boyd M., and Perrin, Donald G., A Selective Bibliography on New Media and Instructional Technology, School of Education, University of Southern California, Los Angeles, April, 1964.

Ford Foundation and the Fund for the Advancement of Education, Teaching by Television, The Foundation, New York, 1961, 87 pp.

Gilbert, Thomas F., "Mathetics: The Technology of Education," Journal of Mathetics, Vol. 1, No. 1, January 1962.

Green, Alan C., editor, Educational Facilities with New Media, Department of Audiovisual Instruction, NEA, Washington, D. C., 1966, 209 pp.

Green, Edward J., The Learning Process and Programmed Instruction, Holt, Rinehart and Winston, Inc., New York, 1962.

Innovations for Time to Teach, Project: Time to Teach, Dept. of Classroom Teachers, NEA, Washington, D.C., 1966, 147 pp.

The Institute for Communication Research, New Teaching Aids for the American Classroom, The Institute, Stanford University, California, 1960, 173 pp.

Kinkade, R.G., and Kidd, J.S., The Use of an Operational Game as a Method of Task Familiarization, Technical Report 59-204, Aero Medical Laboratory, Wright Air Development Center, Wright-Patterson AFB, Ohio, July, 1959.

Lumsdaine, A.A., and Glaser, Robert, editors, Teaching Machines and Programmed Learning: A Source Book, Department of Audiovisual Instruction, NEA, Washington, D.C., 1960.

Lumsdaine, Arthur A., "Experimental Research on Instructional Devices and Materials," in Training Research and Education, Robert Glaser, editor, University of Pittsburgh Press, Pittsburgh, Pa., 1962.

Miller, Neal E., and others, Graphic Communication and the Crisis in Education, Audio-Visual Communication Review, Department of Audiovisual Instruction, NEA, Washington, D.C., 1957, 120 pp.

National Council on Schoolhouse Construction, Planning Facilities for Higher Education, The Council, 1960, 104 pp.

National School Public Relations Association, Technology in Education, Education U.S.A. Special Report, The Association, Washington, D.C., 1967, 24 pp.

Newer Educational Media, Papers of the Regional Research Conference, Pennsylvania State University, University Park, Pa., 1961, 104 pp.

Ofiesh, G. D., and Meierhenry, W. C., editors, Trends in Programmed Instruction, Department of Audiovisual Instruction, National Education Association, and National Society for Programmed Instruction, Washington, D.C., 1964.

Popham, W. James, "Tape Recorded Lectures in the College Classroom," AV Communications Review, Vol. 10, No. 2, March-April 1961.

Postlethwait, S. N.; Novak, J.; and Murray, H., An Integrated Experience Approach to Learning With Emphasis on Independent Study, Burgess Publishing Company, Minneapolis, Minn., 1964, 114 pp.

Schramm, Wilbur, The Research on Programmed Instruction: An Annotated Bibliography, Bulletin No. 35 (OE-34034), Office of Education, U.S. Department of Health, Education and Welfare, Washington, D.C., 1964, 114 pp.

Stolurow, Lawrence M., Teaching by Machine, Cooperative Research Monograph No. 6 (OE-34010) Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C., 1961.

Taylor, Calvin W. and Williams, Frank E., editors, Instructional Media and Creativity, John Wiley and Sons, Inc., New York, 1966, 397 pp.

Trow, William Clark, The Teacher and Technology: New Designs for Learning, Appleton-Century-Crofts, 1963, 198 pp.

Trump, J. Lloyd, "Changing Concepts of Instruction and the School Library as a Materials Center," The School Library as a Materials Center, U. S. Government Printing Office, Washington, D. C., 1963.