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PROFESSIONAL TEACHER EDUCATION: A PROGRAMED DESIGN DEVELOPED BY THE AACTE TEACHER EDUCATION AND MEDIA PROJECT.

American Association of Colleges for Teacher Education, Washington, D.C.

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Identifiers-Teacher Education and Media Project, TEAM Project

Part 1 of this report is a general introduction summarizing the 3-year Teacher Education and Media (TEAM) project (ED 003 156) which prompted this effort to (1) suggest a way of reconstituting the objectives and programs of teacher education and (2) show how media can be used to heighten the effectiveness of the program. Part 2 presents the "major contribution of the TEAM project." An instructional systems approach to teacher education is discussed with the use of a teaching-learning situation model. Then the proposed preservice professional curriculum plan, based on the systems model, is presented under 5 behavioral objectives. Content and suggested source materials are listed which should enable the prospective teacher to (1) analyze teaching and develop a desirable concept of teaching, (2) form concepts basic to the logical organization of instructional content, (3) form concepts basic to directing the cognitive operations of his students, (4) refine, extend, and integrate the above 3 types of concepts by testing them empirically (with the use of media systems and simulated experiences), and (5) demonstrate and evaluate teaching strategies through critical assessment of behavior in actual teaching experiences. Part 3 discusses implications of the proposed plan with respect to materials, staffing, institutional organization, facilities and equipment, and school-college relations. A 63-item bibliography is included. (JS)

professional

teacher education



a programmed design developed by the AACTE teacher education and media project

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PROFESSIONAL TEACHER EDUCATION

A Programed Design Developed by the
AACTE Teacher Education and Media Project



*The American Association of Colleges for Teacher Education
1201 Sixteenth Street, N.W., Washington, D.C. 20036*

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FOREWORD

The TEAM project (a project to improve the professional sequence in preservice teacher education through the selective and planned use of new media), as most projects do, had its inception in the conversation of a few teacher educators who were seriously concerned about current programs of teacher education. It represents the ideas and thinking of many more teacher educators who were equally concerned with the problem of properly preparing teachers. It has stimulated a great deal of discussion concerning what really should make up the preservice professional component of a program of teacher education. In some cases, it has prompted action and resulted in the improvement of teacher preparation programs.

As with most projects, it achieved its objectives only in part. It leaves much that still needs to be done. That fact notwithstanding, this project has caused teacher educators across the country to take a new and more analytical look at their teacher preparation programs. As a result, they are more keenly aware of the need to know what teaching is and how it happens. They more readily recognize that a teacher must be knowledgeable of the organization and design of what he teaches. They are more alert to the need for the teacher to know how human beings learn and to the need for knowing how to formulate and implement strategies which will bring about that learning.

The rationale presented here is a thoughtful and well considered one. It is one which can be applied (as subsequent projects will show). It places the use of media within the framework of learning and makes the relationship between media and learning visible and rational.

The manner in which the various research studies reported here are assembled is offered as only one possible configuration. It is hoped that this kind of effort will continue and that alternative proposals will be offered for the serious consideration of the community of teacher education.

Walter J. Mars, Associate Secretary
American Association of Colleges for
Teacher Education

July 1968

ACKNOWLEDGMENTS

The American Association of Colleges for Teacher Education is deeply indebted to many people for their contributions to the project described herein. Including their names is small compensation for their important contributions, but it is hoped that this procedure conveys in some small way the appreciation of the AACTE.

The people primarily responsible for this effort were the project staff: Herbert F. LaGrone, director; Desmond P. Wedberg, associate director; Clarice Y. Kelley, research assistant; and Ellen Hegman, secretary.

The work of the staff was ably guided by the members of the Advisory Committee: Asahel D. Woodruff, L. O. Andrews, Arno Bellack, David L. Clark, David Krathwohl, B. O. Smith, A. W. VanderMeer, Robert Poppendieck, and Gerald Torkelson; as well as by the members of the AACTE Committee on Studies and the AACTE Sub-Committee on Teacher Education and Media.

Special thanks is due to Asahel D. Woodruff, who as chairman of the Advisory Committee, member of the Committee on Studies, and liaison member of the Sub-Committee on Teacher Education and Media has provided help and guidance to this project from beginning to end.

Mrs. Rebecca Fiske deserves praise for her editing. The Association wishes also to thank the many professors, administrators, and faculty members in schools and colleges of education at member institutions throughout the country. Without their efforts and contributions this project would not have been possible.

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Part I

1. INTRODUCTION

This study, sponsored under Part B, Title VII, NDEA, was conducted between January 25, 1963, and October 31, 1965. In spite of — or perhaps because of — its rather extensive title, the project became known among the teacher education community as "the TEAM project," standing for Teacher Education and Media. In general terms, the TEAM project was divided into two major components: the curriculum component and the media component. However, both parts grew from the same basic assumption, as noted in the original design of the study.

Because of the rapid development and continuous introduction of instructional technology at all levels of education, new and extended demands are being made of all teachers. This fact has many implications for teacher education. One major function of teacher education must be the continual assessment and modification of its program if prospective teachers are to effectively meet the challenges of our technological society. More particularly, in view of the general disposition of teachers to teach as they were taught — to learn what they experience and to practice what they learn — it is important that prospective teachers experience and be encouraged to conceptualize and evaluate teaching and learning through the use of the new media in their preparation.

As has been noted, this project consisted of two components which were carried on simultaneously. The professional curriculum component was concerned with the development and analysis of professional teacher education programs that took into account the impact of the new technology. The media utilization component gave its attention to the acquisition and reporting of current research and utilization patterns of new media in teacher education.

This report is set up in three major parts. Part I includes this general introduction and a description of the activities of each component of the project. These descriptions are presented separately in keeping with the design mentioned above. Part II is the major section of the report and represents the major contribution of the TEAM project. Part III notes some implications and offers some general conclusions.

2 PROCESS AND PROCEDURE

Upon initiation of the TEAM project, the following full-time staff was employed:

Dr. Herbert F. LaGrone, Director
(Dr. LaGrone is now Dean, College of
Education, Texas Christian University,
Fort Worth, Texas.)

Dr. Desmond P. Wedberg, Associate Director
(Dr. Wedberg is now Director, Division of
Educational Technology, University of
Maryland, College Park, Maryland.)

Mrs. Clarice Kelley, Research Assistant

Miss Ellen Hegman, Secretary

An Advisory Committee was also appointed by The American Association of Colleges for Teacher Education, in consultation with the Advisory Council of the Associated Organizations for Teacher Education,* and with the approval of the U.S. Office of Education. This Advisory Committee consisted of seven members broadly representative of teacher education:

Asahel D. Woodruff, Professor of Educational
Psychology, University of Utah (Chairman)

L. O. Andrews, Professor of Education,
The Ohio State University

* Associated Organizations for Teacher Education:

American Association of Colleges for Teacher Education
American Association for Health, Physical Education
and Recreation
American Association of School Administrators
American Association of School Librarians
American Home Economics Association
American Vocational Association
Association for the Education of Teachers in Science
Association for Field Services in Teacher Education
Association for School, College and University Staffing
Association for Student Teaching
Council for Exceptional Children
Department of Audiovisual Instruction
National Association for Business Teacher Education
National Society of College Teachers of Education
Philosophy of Education Society

Arno Bellack, Professor of Education,
Teachers College, Columbia University

David Krathwohl, Dean, College of Education,
Syracuse University

B. O. Smith, Professor of Education,
University of Illinois

A. W. VanderMeer, Dean, College of Education,
The Pennsylvania State University

Robert Poppendieck, U.S. Office of Education
(liaison representative)

Gerald Torkelson, then with the U.S. Office of
Education, now with the University of Washington
(liaison representative)

Curriculum Component

The Advisory Committee provided supervision for the project staff, approved reports, and offered guidance in developing proposals for carrying out subsequent phases of a long-range program. The Advisory Committee recommended that the staff develop a model for identifying specific objectives of teacher education based on teaching acts, or what teachers do. The model was to provide for the identification of the concepts and proficiencies needed for effective teaching.

The initial model developed by the project staff was presented in the following form:

A statement of behavioral objectives (teacher competencies) requires a theory of teaching as a profession which will accommodate the variety of teaching assignments, the accepted differences in teachers and teaching, and the recognized variance in adequate teacher performance. The theory must also provide for the dynamic and diverse character of the culture in which teaching occurs and the educational structure provided therein, the evolutionary nature of American education, the rapid growth in human knowledge, and the technological developments related to teaching and learning.

A number of efforts to develop such a theory continue to be made. The publication of the Handbook of Research on Teaching(18) is evidence of a continuing effort in the study of teaching. In this volume Wallen and Travers(56, p. 490) have suggested that "the behavior of the teacher (T) is a function of the goals to be achieved (Rg) and the present behavior of the pupil (Ri)." Symbolically this concept is presented as an equation: " $T = f(Rg, Ri)$." The writers further state that the approach "involves not only the problem of measuring the variables but also that of determining the values of the constants which the system of equations would inevitably require."

Ryans(45) has provided a "systems approach" that yields a number of the equations that may be developed within a theory. By utilizing the notion of "feedback," the dynamics of teaching are diagramed in the schematic presentations. The "teacher system, pupil system, and situation complex" are considered to be the major units for the variables related to pupil learning. The teacher behavioral areas are suggested as "motivating-reinforcing, presenting-explaining-demonstrating, organizing-planning-managing, and counseling-advising."

Clark and Cyphert(12) have recommended an adaptation of "A Paradigm for Research on Administrator Behavior" by Halpin as a conceptual reference for the study of teacher behavior and propose that teacher behavior be the basis for the professional education of teachers. Panel I of the paradigm includes the "Teaching Task" and subtasks for a given time. Panel II, "Teacher Behavior," is presented as "Behavior as Decision Maker" and "Behavior as Group Leader." Also included in the panel is the "Teacher's Perception of Subtasks." Within Panel III are the "Variables Associated with Teacher Behavior." The variables are designated as "Teacher Variables, Pupil Variables, Content Variables, Class Group Variables, and Extra Class Variables." Panel IV establishes the "Criteria of Teacher Effectiveness."

Teachers must make a variety of decisions. The resultant behavior reflects the way the factors involved have been arranged or combined. Some of the decisions are very deliberate and judicial. Others may be made intuitively on the basis of preparation and study or experience, or a combination of both preparation and experience. Some decisions may produce a near habituated type of behavior under certain conditions. In the press of classroom work some behavior may result without conscious consideration.

When Hight(32) views teaching as an act and not as a science, certain variables are identified. Included are liking and knowing pupils, knowing subject matter, planning and preparation, methods, the school or college in which the teaching was centered, and certain attributes of the teacher. In some examples of teaching the influence of the culture as a variable is noted.

McDonald(41) gives emphasis to the theoretical study of teaching and the teacher as a decision-maker. A basic premise of the book is as follows: "Essentially, the teacher is a decision-maker who, on the basis of his evaluation of the pupils' readiness for learning or present status in learning, organizes a learning experience which will lead the child on to new differentiations and new integrations of behavior." He develops three general factors that influence a particular teacher decision: "(1) cultural factors, (2) professional factors, (3) scientific factors."

The variables associated with teacher decisions for behavior may be grouped in a number of ways, as shown by the various writers. The TEAM project considered three major categories:

1. **TEACHER-SOURCE:** the teacher as a person and professional. This category includes such factors as the teacher's self concept, adjustment, needs, interests, motivation, attitudes, values, abilities, capacities, knowledge and understandings, and the persistent and transitory

physical-physiological characteristics related to behavior.

2. **PUPIL-SOURCE:** the student as a person, learner, and member of a group. The areas of student abilities, capacities, attitudes, values, interests, and physical-physiological and learning factors are included in this source.
3. **ENVIRONMENT-SOURCE:** the variables external to the teacher and student which affect the teacher, teaching, learning, and/or the pupil. This is a complex variable group that includes subject content, selected aims and objectives, teaching resources or aids, methods or techniques, the local and larger community influences, and the institutionally related factors of policy, organization, administration, and facilities.

On the basis of these three sources of variables, a simplified and generalized expression states that teacher behavior is the result of an interaction of the related variables and may be written symbolically as:

$$T_b = F[\overline{(T_v)}, (P_v), (E_v)]$$

This or a similar statement meets the requirements for a theoretical base for the study of teacher behavior. A statement of a desired teacher competence should be explained as a result of the interaction of the several variables. Behavior different from that proposed or desired can be explained by a change in the significance of one or more variables, inadequate research or knowledge in a variable area, or possibly some extreme effect of a given variable at a particular time and situation.

The dimensional nature and lack of knowledge about some variables involved may cause an expression of teacher behavior to be given in dimensional or alternative form. Since no two teaching situations are identical and a true replication of a given situation is improbable, generalizations of desired or adequate teacher behavior would be better expressed in a dimensional form. McDonald(41) proposes that "each of the decisions that a teacher makes in the course of conducting the educative act is in effect a hypothesis about learning." He also writes of the "probabilistic" nature of the hypotheses.

Within this reference, a program of teacher education, particularly the professional element, should be designed to include in some way attention to all the identifiable variables, the variance within a given variable area, and the interrelatedness among the variables or variable areas affecting what teachers do. The question of what teachers should or will do in the future would be resolved on the basis of changes in the knowledge and understanding of the variables. A significant change in one variable, such as the availability of programmed instructional material, team teaching assignments, administration, or the structural emphasis in a subject area, would serve as the basis for altering a specific teacher decision for behavior.

The project staff developed a cylindrical figure (Figure 1) to partially illustrate the dynamics of teaching as decision or hypothesis making based on the interaction of selected variables. The model will serve as the frame

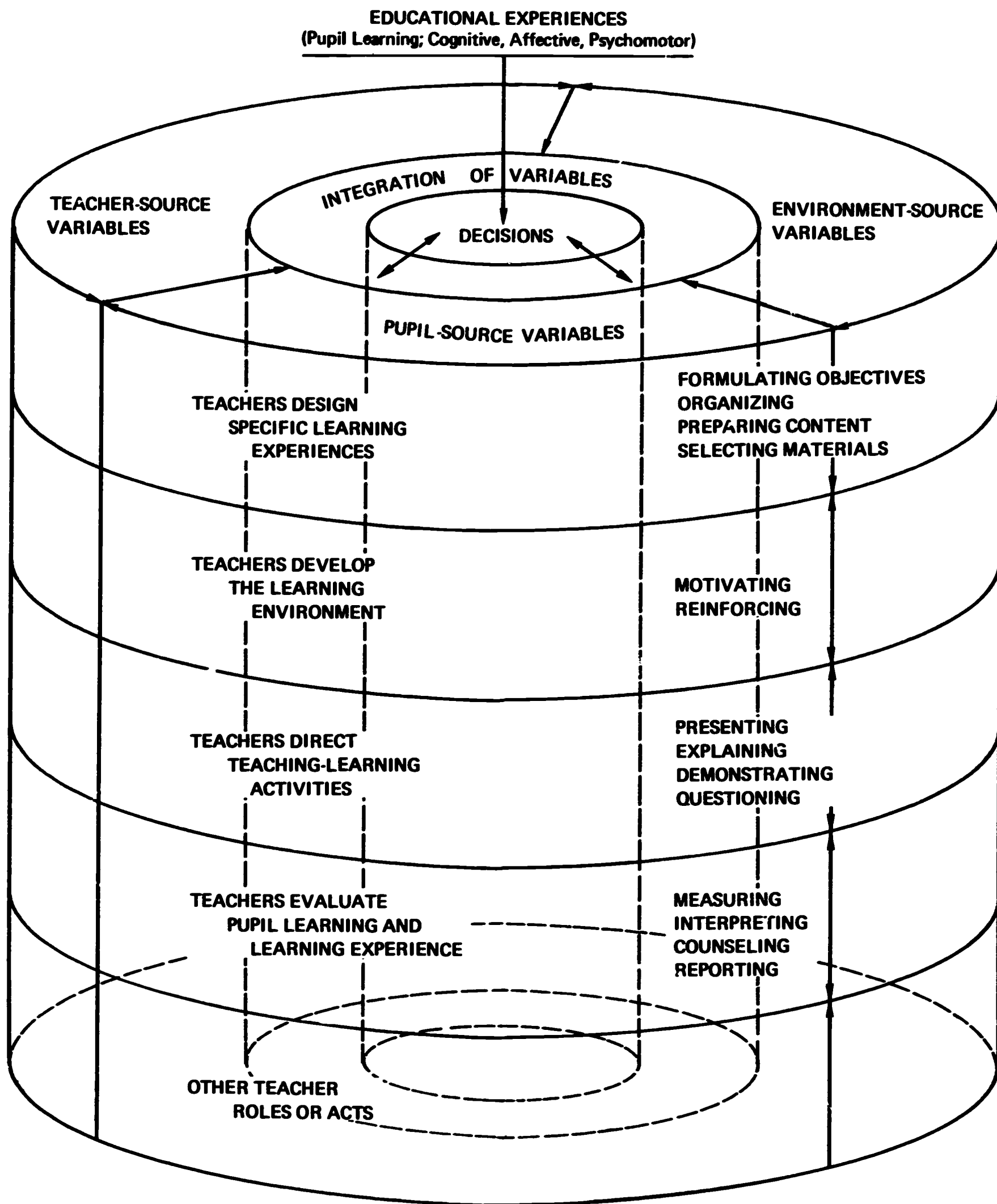


Figure 1. Model for the Dynamics of Teaching

of reference for an analysis of teaching and the identification of some of the basic concepts, attitudes, and abilities necessary for appropriate teacher behavior. Educational experiences expressed as pupil learnings in the cognitive, affective, and psychomotor domains and a selected teacher act provide the references for a specific analysis.

The end surfaces of the model, viewed from above (Figure 2), are formed by concentric circles around a core. The core represents decision or hypothesis making for behavior. The area surrounding the core represents the teacher's effort to process or integrate the variables related to the decision. The outer circle identifies some teacher-source, pupil-source, and environment-source variables. These areas extend vertically through the figure.

There is an interaction between the variables as well as a component directed to integration and decision making. In addition a particular decision may have an effect on future processing and the nature and magnitude of one or more variables.

On the outer surface of the cylinder some of the acts teachers perform are designated. Since the major concern of the TEAM project at this time was the teacher behavioral competencies related to pupil learnings, the horizontal divisions designated were concerned with the teaching-learning acts. Teacher behavior as suggested by Ryans(45), teacher competencies designated by the California Teachers Association(13), or the list of teacher traits and trait actions developed earlier by Charters and Waples(11) could be introduced on the outer surface. The last two listings might require some restatement for analysis within this design.

Four major areas were selected for analysis:

1. Teachers design specific learning experiences.
2. Teachers develop an appropriate learning environment.
3. Teachers direct the teaching-learning experience.
4. Teachers evaluate pupil learning and the learning experience.

The four areas were not considered independent. Each was related to the other, but the divisions were desirable for analyzing the nature and magnitude of the variables.

Other teacher roles or acts might be added to the model by lengthening the cylinder or by a more detailed listing within the four broad areas. Since the preservice program of teacher education cannot develop all of the desired teacher behavioral competencies, some selection was necessary. The TEAM project was not in a position at the time to establish priorities or limits. Two major criteria were later considered in the identification of concepts, attitudes, and skills: first, the understandings necessary for the highest possible level of beginning competence; second, those essential for maximum professional and personal development.

A tentative outline (Figure 3) was developed for the analysis. The two major divisions were "Analysis of Teaching" and "Professional Teacher Education." Under the Analysis of Teaching, the larger area would be

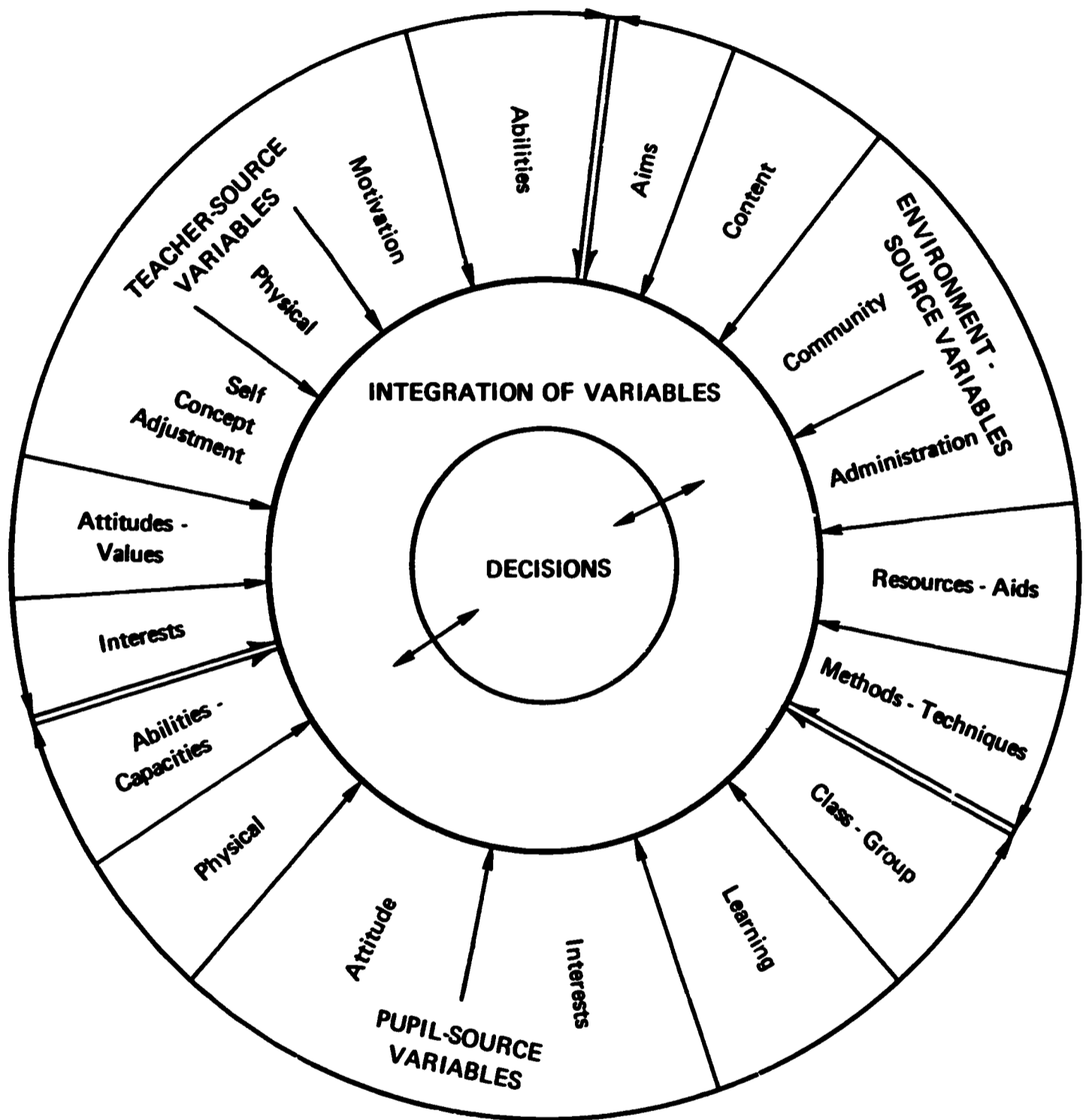


Figure 2. Model for the Dynamics of Teaching, Above View

ANALYSIS OF TEACHING – DESIGN			TEACHER EDUCATION – DESIGN		
Designs Learning Experience	Types of Pupil Learnings	Variables Teacher Pupil Situation	APPROPRIATE TEACHER EDUCATION	Concepts Attitudes Abilities	Instructional Media and Materials
Formulation of Objectives	Cognitive Affective Psychomotor				
Selecting Material					
Organizing Learning Experience					
Etc. or others					

Figure 3. Tentative Outline Form

subdivided into the three major types of pupil learnings. The relationships of the variables to teaching were to be considered. The concepts, attitudes, and abilities for professional education would be derived from the analysis of teaching and certain instructional media and materials suggested.

On the basis of this initial model, the TEAM project did not intend to propose certain courses in education. Courses were considered to be a means for professional development and an institutional function. It was felt that more emphasis should be given to certain of the derived concepts or conceptual areas.

The original design of the project called for the use of task forces in developing a statement of the major behavioral competencies and new media utilization in programs of teacher education. The project staff recruited teams within three or four interested colleges and universities.

The selection of task force personnel was designated a staff function by the Advisory Committee. Since the personnel were to be members of faculties and under contract to universities, criteria were developed which considered qualifications of the institutions as well as personal competencies of future task force members.

The personnel would be —

1. located in a college or university in which the project could have a broad institutional base.
2. associated in an ongoing program with a similar orientation, or one where this could be readily established.
3. provided with adequate new media resources, with evident interest in their utilization.
4. able to establish a relationship or coordination with other on-campus, regional, or national efforts supportive of the project.

The TEAM project established four task forces, with coordinating personnel, in the following institutions:

- | | |
|--------------------------------------|---------------------------------|
| 1. University of Florida | Kimball Wiles
Ira Gordon |
| 2. Indiana University | Henry A. Bern
Lawrence Brown |
| 3. North Texas University | Dwane Kingery
Darrell Dunham |
| 4. University of Southern California | David Martin
Robert Heinrich |

In addition to reacting to the initial model, each institutionally oriented team worked on the basis of a total analysis as previously described. The project staff and task force chairman coordinated the independent efforts.

Two other approaches to the identification of behavioral competencies operated concurrently with the task forces. First, each member organization

of the Associated Organizations for Teacher Education was asked to study the problem through special committees. While it was recognized that the approaches of the several groups would be different, the contributions of these groups as they studied the desired behavioral competencies from a more specialized point of view materially strengthened the total project effort.

The second approach was made by the project staff, and together with the input provided from the task forces and AOTE, led to the following continuum of discoveries and conclusions:

1. The TEAM staff reviewed the records and literature within the variable areas of the model and expanded the model to a more inclusive list of competencies and roles. The review of the typical or traditional literature (textbooks, journals, periodicals, books, etc.) of the professional component of teacher education and the use of the media within that component led to a recognition of the potential for media in the existing teacher education curriculums.
2. The discovery of the potential of the media led to the further recognition that the integrated and functional use of media in instruction demanded a clear curriculum structure. It was evident that the traditional curriculum in its very segmented form could not interrelate media and content.
3. The orientation of the traditional curriculum placed the prospective teacher in a learner position and maintained him in that position throughout his professional studies.
4. It became quite clear that the teaching function required the making of decisions and that one of the teacher's major roles is decision maker.
5. One of the prime efforts of the project should be the identification of the areas of decision making and the conceptual bases upon which those decisions are made.
6. These conclusions led to an extensive study of contemporary research on teaching, learning, content structure, and technology with particular emphasis on the works of Woodruff and B. O. Smith.
7. It was discovered that much of the contemporary research on teaching, learning, content structure, and technology tended to converge.
8. Criteria were established for content selection with the basic criterion being relevance to teaching.
9. Power functions were developed for the new media which led to general guidelines for media application.
10. A model was developed to interrelate the conceptual bases for teacher decision making.

This model appeared in the form of A Proposal for the Revision of the Pre-Service Professional Component of a Program of Teacher Education. In publication form, this model was given extremely wide dissemination by the AACTE among the teacher education community. Its impact has been extensive. In revised form, it makes up Part II of this report.

Media Component

The Media Component of the TEAM project served the following functions:

1. Primary responsibility was to support the Curriculum Component in its demands for media, especially in the development of presentation materials and in the dissemination of information about curriculum revision in the field of teacher education. Audiovisual equipment was made available to the project early in 1963, and mediated programs were presented by the project staff to (a) open meetings and general sessions of the AACTE Annual Meetings in 1964 and 1965, (b) the School for Executives (AACTE) in 1964, (c) more than a dozen teacher education faculty groups involved in the project's approach to curriculum revision, (d) the meetings of the Advisory Council of the Associated Organizations for Teacher Education (AOTE), (e) the semiannual meetings of the Project Task Forces, and (f) the periodic meetings of the Project Advisory Committee.

2. The Media Component undertook to issue periodical reports through the AACTE to teacher educators regarding new and promising uses of new media in teacher education. Toward this objective, two dissemination reports were developed.

3. The Media Component began the development of a resource file and clearinghouse of materials and information which could serve as a foundation for the development of technological instructional units for teacher education. Included in the clearinghouse function were the following: establishment of a Teacher Education Information Center (TEIC) within the AACTE; establishment of media input-output resources, including a program of field visits to teacher preparation institutions, presentations on teacher education and media to national conventions of educational associations, and reports through AACTE publications; and national surveys on instructional media utilization among teacher preparation institutions.

Procedures, Findings, and Conclusions

The initial task undertaken by the Media Component was an exhaustive search of the published literature and unpublished research reports to determine what had been disseminated relating media to teacher education; what research had been undertaken, was completed, or was in progress; and what nonprint instructional media existed for use in the teacher education curriculum. To verify this search of references, especially in the area of unpublished research, a computer search was made at the Educational Research Information Center (ERIC) at Case Western Reserve University. Once collected and organized, this information was published under the title Teacher Education and Media—1964, A Selective, Annotated Bibliography. This

fifty-page booklet was distributed without charge to teacher education institutions in the United States and was made available at cost (50¢) to all others.

During the preparation of this publication, it became obvious to the project staff that instructional media in the area of teacher education were virtually nonexistent on the commercial market, and that those materials available were dated. At the same time, however, through the literature search and field visits, evidence of existing locally-produced instructional media appeared. A national survey of all teacher preparation institutions was conducted to discover the extent of new media utilization as well as the availability of instructional materials that might be exchanged among colleges and universities on a national basis. The first phase of the survey was concerned with programmed instruction. Conducted and published initially in 1963, follow-up studies were completed in 1964 and 1965. The second phase of the national survey was the development of a questionnaire on New Instructional Media Utilization in the Pre-Service Professional Preparation of Teachers—May 1964. This twenty-eight item questionnaire, developed with the assistance of the Research Division of the National Education Association, was sent initially to every known institution that prepared elementary and/or secondary classroom teachers. With assistance from the U.S. Office of Education, National Education Association, and Educational Testing Service, a master file of tab cards was compiled yielding a total of 1,204 institutions to receive questionnaires. Initial response was disappointing, so two follow-up mailings were made before finalizing a cutoff date in January 1965. At this time, 606 usable questionnaires had been returned, or approximately 50 percent of the population. Generalizations of findings important to the TEAM project follow here.

1. As might be predicted, the scope of new media utilization in teacher education is consistent with national patterns in elementary and secondary schools. Sound films and filmstrips are the overwhelming choice, followed by disc and tape recordings and overhead transparencies. While suitable commercially developed instructional materials are in short supply, this shortage is being met by a trend toward locally produced materials by the teacher preparation institutions. In some curriculum areas, this trend is resulting in an unnecessary duplication of effort, but until the new instructional media are more widely accepted and used by teacher educators, commercial producers will not find attractive the development of materials in this field. Paradoxically, it could well be that the dearth of commercial materials is the prime factor inhibiting acceptance among teacher educators.

2. Instructional Television. Almost one in three teacher preparation institutions had television facilities operable during the year 1964-65. These were mostly closed-circuit television installations concentrating on programing for directed observation originating from the campus laboratory school, for instruction in techniques of television utilization in the classroom, and for large-group instruction of lower division courses. Videotape recorders, particularly the lower cost, portable, helical scan models, will be in use during the coming year in almost one in four teacher preparation institutions. In the professional education sequence, the

videotape recorder is most often used to record and play back directed experiences in classroom observation, demonstration lessons by methods professors, demonstration lessons by student teachers, role playing assignments, and counseling interviews.

3. Programed Instruction. Of the 352 commercially available programs listed in the U.S. Office of Education sponsored Programs, '63,* not one was designed for the traditional content of the professional education sequence. Continuing surveys by the project have discovered about ninety programs relating to the professional sequence being developed, revised, and used by individual faculty members concerned with this content area. Further, about one-fourth of responding institutions are offering courses about programed instruction, and about one-third are teaching program writing as part of a teacher preparation course not primarily concerned with programed instruction. The programs in use are typically concerned with educational methods, measurement and statistics, and psychological foundations.

4. Multimedia Presentation Systems. As burgeoning enrollments in higher education force upward the student-instructor ratio, facilities are being developed to allow the instructor to present the lecture-demonstration part of his course to large classes, ranging in size from 150 to 600 students. Augmenting the instructor in this larger-than-life setting is the multimedia presentation system. This system, programed by the instructor from his electronic lectern, permits through rear-screen projection the instantaneous use of large-screen television, motion pictures, slides, filmstrips, and prerecorded audiotapes. Some systems permanently record the instructor's lecture and multimedia cues on tape for later use in multi-sectional courses in the absence of the instructor. Kinescope and videotape presentations offer this same capability.

5. Single Concept Films. The recent acceptance of 8mm motion picture equipment for small-group and individual use has resulted in a rapidly growing interest in shorter educational films. These films, in continuous loop cartridges which simplify projector operation, develop a single concept to be learned in two to five minutes. The films are inexpensive to purchase, less expensive to produce on one's own campus. Some institutions have incorporated this type of film in self-instructional, automated, audiovisual laboratory courses. Several teacher education institutions are using 8mm films to record the performances of student teachers, and rear-screen projectors are now available which will take continuous loop cartridge sound films up to twenty-eight minutes in length. The low cost and ease of operation features, plus the creative capabilities of coordinated use with programed instruction and auto-instruction, promise great prominence for 8mm films in the future.

6. Simulation. One other current use of the new media in teacher education needs mention. Recently, a procedure for using simulation in the preservice education of classroom teachers was created through a pilot

* Programs, '63: A Guide to Programed Instructional Materials Available to Educators by September 1963. Washington, D.C.: U.S. Government Printing Office, 1963. 830 pp.

program of research and development at the Teaching Research Laboratory of the Oregon State System of Higher Education by Dr. Bert Y. Kersh. A simulation facility was built utilizing multiple motion picture techniques, and sixty critical incidents were filmed simulating a variety of sixth-grade classroom situations. Following the student teacher's reaction (through role playing) to each critical incident, a short film clip was rear-screen projected to reveal the consequences of the teacher's behavior.

Such were the major new media developments in teacher education as reported in the project's national survey. A final item on the questionnaire asked the respondent to predict utilization trends through 1970. We found that utilization of the various media will remain fairly constant with three exceptions. Programed instruction will get greater emphasis, and the instructional programs will be developed by individual faculty members. Computer-assisted instruction will receive an increasing emphasis in total college programs. Finally, the greatest quantitative growth to be made will be in the development and utilization of televised education at the higher educational level.

Several items on the questionnaire sought to isolate factors presently inhibiting media innovations on teacher education campuses. Findings pointed to a lack of money, manpower, machines, and materials. The materials scarcity is perhaps our most critical problem.

The next major phase of the Media Component activities developed from innovations discovered from the national survey and subsequent field visits. A great curiosity existed among institutions preparing teachers concerning what other institutions were doing to improve instructional programs. From exemplary programs revealed by questionnaire returns, eighteen teacher preparation institutions were asked to prepare demonstration materials for a three-dimensional exhibit during the 1965 AACTE Annual Meeting. This exhibit, designed and developed by Dr. Walter J. Mars of Syracuse University, and supporting publications entitled "Uses of New Media in Professional Teacher Education" became the project's second dissemination report. The exhibit was a popular success, and the project staff subsequently operated the display unit in the New Senate Office Building (at the request of Senator Wayne Morse); for five weeks in the lobby of the National Education Association Building; and during the 1965 annual conventions of the Department of Audiovisual Instruction, NEA (Milwaukee); and the National Commission on Teacher Education and Professional Standards, NEA (New York City).

The remaining major programs of the Media Component related to the clearinghouse function of the project. The beginning of a Teacher Education Information Center was established in the AACTE offices, and the project fed into this center all print and nonprint materials collected or produced during the tenure of the project. While most field visits to teacher preparation institutions and attendance at related conferences and conventions were in response to requests to give speeches and presentations about the TEAM project activities, some in-the-field activities were designed to gather materials for the TEI Center. With the termination of the TEAM project, the TEI Center continues as a responsibility of the AACTE.

Part II

1. INTRODUCTION

Background of the Project

A teacher education program is intended to provide teachers with a set of special competencies without which they cannot teach effectively. It is assumed that teachers do not naturally have those qualities and that they can acquire them only from a teacher education program. The extent to which teacher education fulfills this intention has never been known, either by its friends or its critics.

Discontent with programs has been expressed for years by a few educators. Critics have been especially vocal since the space race began. The volume of such expression, both internally and externally, has steadily increased in recent years.

Since about 1960 the discontent has turned into a vigorous search for the ingredients of a better program. As of 1968 that search has commanded the attention of the whole nation, received massive financial support, and resulted in a wide variety of activities from both within and without the ranks of professional educators. For some forty years prior to 1960 a less widespread search for improvement in the curriculum and teaching practices of the pre-college schools was under way. It stemmed from the philosophical ideas of a few great men, of whom John Dewey is perhaps the best known and most provocative. Innovations that were actually tried or widely advocated, however, were not adequately founded in facts from the basic disciplines, and many of them were made impressionistically. The result was a long record of transient ideas about purposes and programs, none lasting very long, and none seeming to overcome the defects; none, in fact, having more than a superficial impact on traditional practices which have been so resistant to change.

These past weaknesses include —

- An operating system without adequate anchorage in its underlying sciences. Psychologists openly said they could offer nothing helpful to educational program planners.
- Discontent over (a) lack of impact on out-of-school life; (b) low

motivation of students; (c) excessive failure and dropout rates.
— A lack of definitive descriptions of good teaching, or of ways of differentiating between good and poor teaching.

Recently the picture has changed. A new literature on human behavior and learning has developed. One of its most seminal qualities is that it is basically analytical and descriptive, rather than prescriptive. For the first time we are seeing what behavior, learning, knowledge, and teaching actually are.

The role of knowledge of subject matter in behavior is becoming visible. The verbal interaction process, the chief tool of a teacher, has been investigated extensively. The phenomenon of interpersonal interaction and influence has been examined. The role of perception in learning has been studied, and media of all kinds have taken on new importance as instruments for more powerful perception and concept formation.

These developments appear to offer the possibility of describing a set of defensible objectives for teacher education, of identifying the subject matter and educational experiences required to achieve those objectives, of describing the way teaching ought to be, of specifying the requirements for teaching materials and processes, and of setting up criteria for evaluation of the programs and, ultimately, the products.

Purpose of the Project

This project was undertaken to (a) suggest a way of reconstituting the objectives and programs of teacher education, and (b) show how media can be used to heighten the effectiveness of the programs. The initial major effort concentrated on objectives and programs, since media were regarded as tools to be used in an integrated relationship between objectives and the content and processes of teaching.

The new literature contains many implications for teacher education and the use of media, with particular reference to —

1. Human behavior and its change processes: change as a product of behaving, the component phases of learning, and the allied component phases of teaching.
2. Objectives for education.
3. The nature of subject matter and of knowledge of subject matter.
4. The subject matter input processes and teaching materials and media.
5. Teaching processes, including instructional unit designs and teaching strategies of all kinds.

Behavior and Behavior Change

A search of the literature was made first to give the project a format or model upon which to proceed. Central to this search was the literature on human behavior, with its emphasis on the

mediating* variables that govern behavior. Woodruff's models of the cybernetic cycle of behavior (Figure 1) and the component elements of behavioral objectives (Figure 2) were adopted as a tenable working concept.

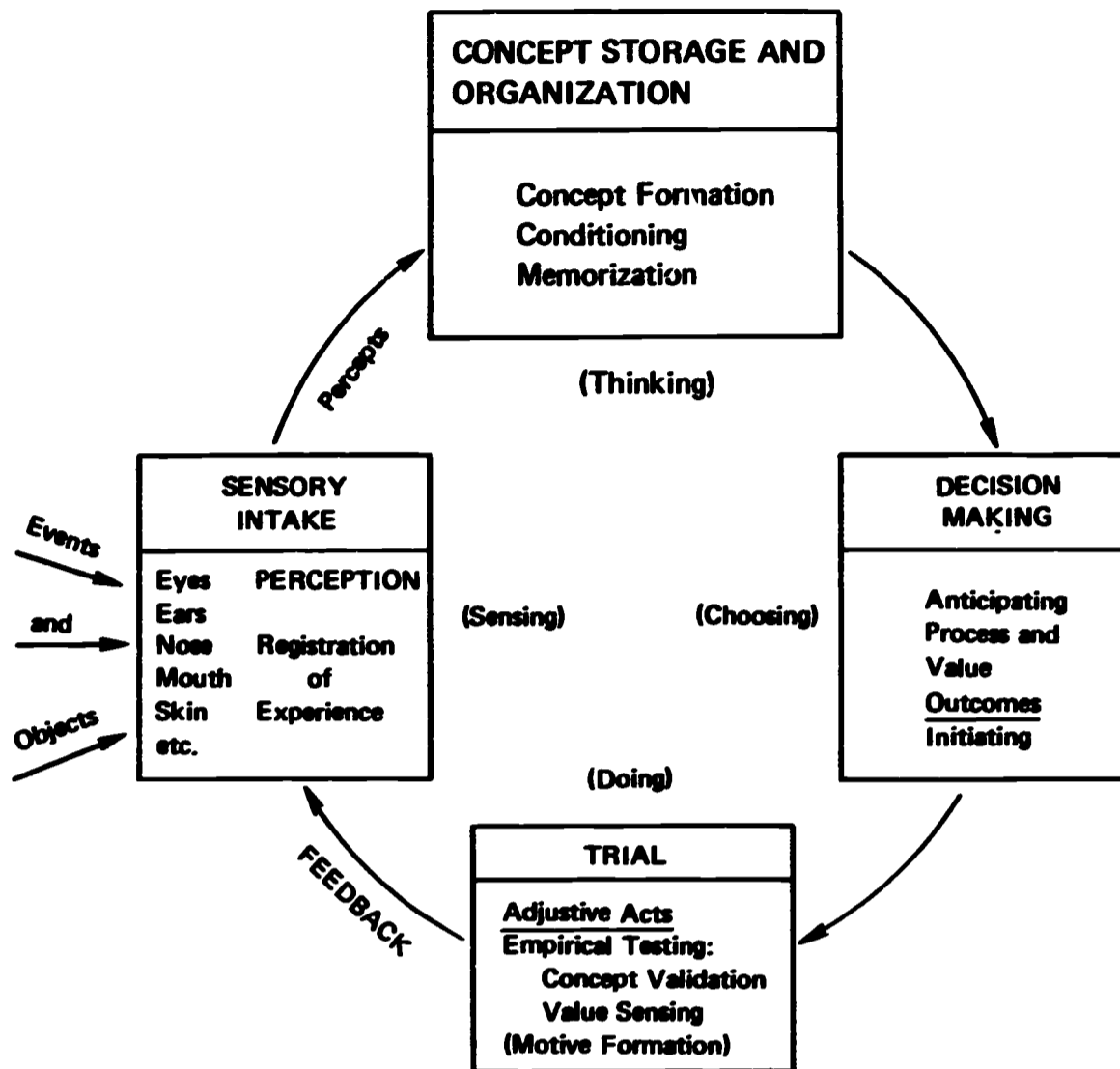


Figure 1. The Cognitive Cycle in Behavior and Learning (62)

Behavior is viewed as an energy system. It is characterized by —

1. An input process (sense of perception).
2. An internal storage and organization function (thinking, consciously or subconsciously; conditioning; and memorizing) which establishes mediating variables (concepts, conditioned operants, and memorized data and vocabulary).
3. A response or output function which consists of:
 - a. Use of the conceptual mediating variables in setting up an intent or goal.
 - b. Use of the conditioned variables in executing the intent and moving toward the goal, and
 - c. Use of the memoric variables (information and vocabulary) in communicating intents and other thoughts.
4. An impact on some part of the external environment, with a consequence of some kind, and

* This term is used in the psychological sense and is not to be confused with the meaning given by instructional technologists.

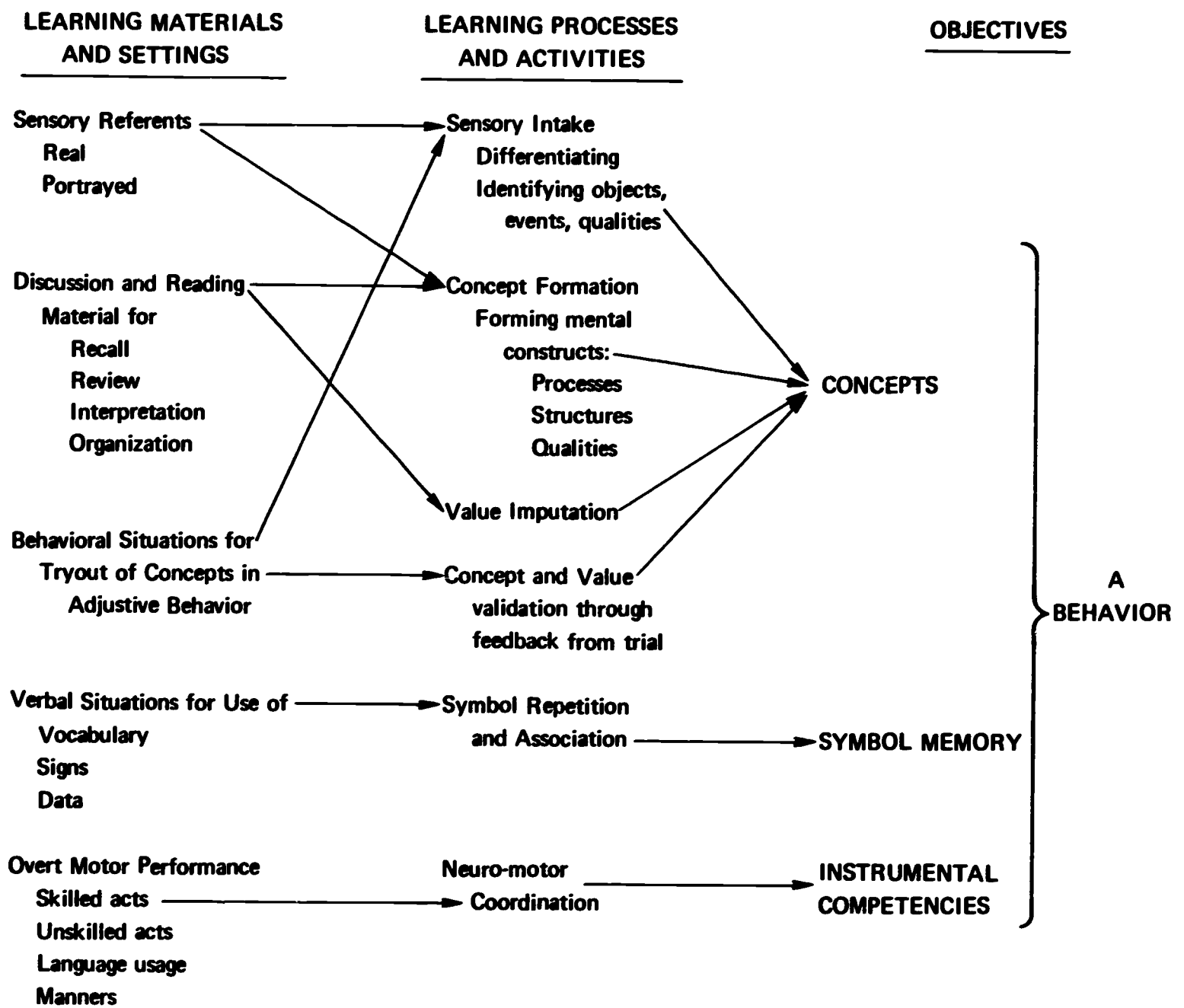


Figure 2. The Relationship Between Objectives, Learning Processes, and Educational Materials and Settings (58)

5. Feedback via the input channels from the impact and consequence.

A highly important part of this cycle is the interaction between the mediating variables and the output and feedback function. The mediating variables determine the intent and the form of the output (overt behavior), and the consequence and its feedback shape the mediating variables. This empirical shaping affects all three variables, the conceptual patterns, the conditioned patterns, and the memory patterns, each on the basis of its own dynamics.

It is of particular importance to note that the matter of prime concern is overt behavior, not "knowledge." Knowledge is deemed to be valuable because it leads to behavior. Behavioral objectives have become attractive because it is behavior we are supposed to modify through education. Thus, whenever we speak of knowledge as an aim of instruction, we should be aware that it is worth pursuing only to the extent it is capable of giving rise to behaviors which are useful in life and which we are attempting to

cultivate through education. Similarly, we should be aware that the pursuit of knowledge is profitable only when the pursuit is conducted in a manner which enables the proffered content to penetrate the student's internal makeup and add to or change the mediating variables that control his behavior.

Figure 2, an expansion of a diagram developed earlier by Woodruff for use by the TEAM project, presents three classes of mediating variables as components of a behavioral objective for use in teaching. For each of the three (concepts, instrumental competencies, and symbol memory), the figure suggests the nature of the required learning process and the essential specifications of teaching materials to be used for that kind of learning.

Teaching

This model of behavior was adopted for several reasons. It may be used to portray both teacher behavior and learner behavior. The learner's behavior puts emphasis on the formative stages of concept formation, operant conditioning, and the memorizing of information and vocabulary. The teacher's behavior puts emphasis on the use of reasonably well established concepts, operants, data, and vocabulary in his work as a director of learning. An educative program developed on such a common model, if it proves to be effective in practice, would apply to teacher education, to teacher behavior on the job, and to the education of students in the schools, requiring only the plugging in of the appropriate subject matter in each situation.

Thus the teacher is regarded as a decision maker and executor of his decisions in matters affecting the learning of students in his classes. A major component of teacher education then becomes that of helping prospective teachers acquire a body of concepts which will give rise to sound decisions about teaching actions, a set of instrumental behaviors that will enable teachers to carry out their decisions effectively, and a store of data and communicative tools to be used in connection with the teaching behaviors.

The Conceptual Variables

The conceptual variables provide for a variety of capabilities, as suggested by such terms as thinking, feeling, making decisions, solving problems, having and responding to values, displaying various attitudes, appreciating, and so on.

When concepts are to be cultivated in an educative program, whether for teachers or others, they must be clearly identified and made the objectives of instructional units. It is possible to speak of concepts in many ways, and to use many forms of expression. Each form has its own uses. No one form is suited to all possible uses of conceptual statements. The terminology used to refer to concepts also varies among writers.

B. Othanel Smith(49) considers concepts as nodes in the development

of cognitive networks. Concepts are foci of organization in the mental makeup of the individual: focal points in the organization of experience.

When concepts are expressed either symbolically or operationally, Smith prefers to call them definitions. His two basic classifications of concepts are —

1. Descriptive, which includes the classificatory, relational, and operational concepts.
2. Valuative, which by their very nature embody preference.

A number of people prefer to think of the when-then form of concept statement as a proposition. While the terminology used is different, the purposes of putting content into a conceptual form and assisting the student in the formation of concepts are essentially the same.

The research on cognition by Hilda Taba(53) offers several propositions about learning which are directly related to selection and organization of content. The following are of particular significance —

1. Cognitive operations are an active transaction between the individual and his environment or the material under study.
2. Individuals inevitably build mental schemes with which to organize the information they encounter.
3. The quality of the learning experience determines the degree of productivity of these schemes.
4. Thought matures through a progressive and active organization and reorganization of conceptual structures.
5. The individual fits the information he receives at any moment into the conceptual scheme he already possesses.
6. When the requirements of the situation do not fit his current scheme, the individual is forced to alter or extend it to accommodate new information. (Piaget calls this fitting process "assimilation" and the process of alteration "accommodation.")

Flavell(17) from the work of Piaget has developed the following statements that are also important for curriculum development (17, pp. 46-7).

1. Every act of intelligence presumes some kind of intellectual structure, some sort of organization, within which it proceeds.
2. An act of intelligence, be it a crude motor movement in infancy or a complex and abstract judgment in adulthood, is always related to a system or totality of such acts of which it is a part.

The implications of the ideas developed by Woodruff, Smith, Taba, and Flavell are of major importance in the outlining of preservice professional content, if it is assumed that the prospective teacher (teacher education student), because of many and varied exposures to teaching, has formed prior to course enrollment certain concepts about teaching, and that these concepts exist within some sort of conceptual scheme. If it is further assumed that in most instances the concepts or schemes are likely to be incomplete, since the exposure of the prospective teacher has been limited

to the learner position and the criteria for fitting a conceptual structure have been limited to his own learning-behavior style, then the professional education curriculum should give particular attention to the reorganization and extension of the conceptual scheme of teaching that the prospective teacher already possesses.

When the student begins his professional study, he is likely to consider teaching as telling students about his subject, and to have other similarly misleading concepts about other aspects of teacher behavior. If these assumptions are correct, or even partially correct, the first effort in professional education might well begin with the concepts that are directly related to the classroom functions of the teacher. As the scheme of the student is extended, concepts now considered of less immediate concern may be added in orderly sequence.

With this limited reference to the literature, we might now try to describe conceptual statements that are useful for lesson planning. It is reasonable to begin with the assumption that in form a conceptual statement should have certain characteristics which are directly related to the requirements of an effective lesson plan.

In several sources (59, 60, 63), Woodruff has suggested ways of stating concepts which are useful for instructional planning. His statement is given here as expressed in (62):

General definition of a concept: A concept is a relatively complete and meaningful idea in the mind of a person. It is an understanding of something. It is his own subjective product of his way of making meaning of things he has seen or otherwise perceived in his experiences. At its most concrete level it is likely to be a mental image of some actual object or event the person has seen. At its most abstract and complex level it is a synthesis of a number of conclusions he has drawn about his experience with particular things.

A conceptual statement: A description of the properties of a process, structure, or quality, stated in a form which indicates what has to be demonstrated or portrayed so a learner can perceive the process, structure, or quality for himself.

Process concepts: A concept of a process, event, or behavior and the consequences it produces when it occurs. A statement of this kind [should take the form for teaching purposes of the diagram at the top of the following page].

Structural concepts: A concept of an object, relationship, or structure of some kind. A statement of this kind for teaching purposes [should take the form shown on the following page].

Quality concepts: A quality is a property of an object or process and has no independent existence. Nevertheless, we speak of qualities as if they had independent existence by abstracting them or taking them out of objects or processes in which they are found and by treating

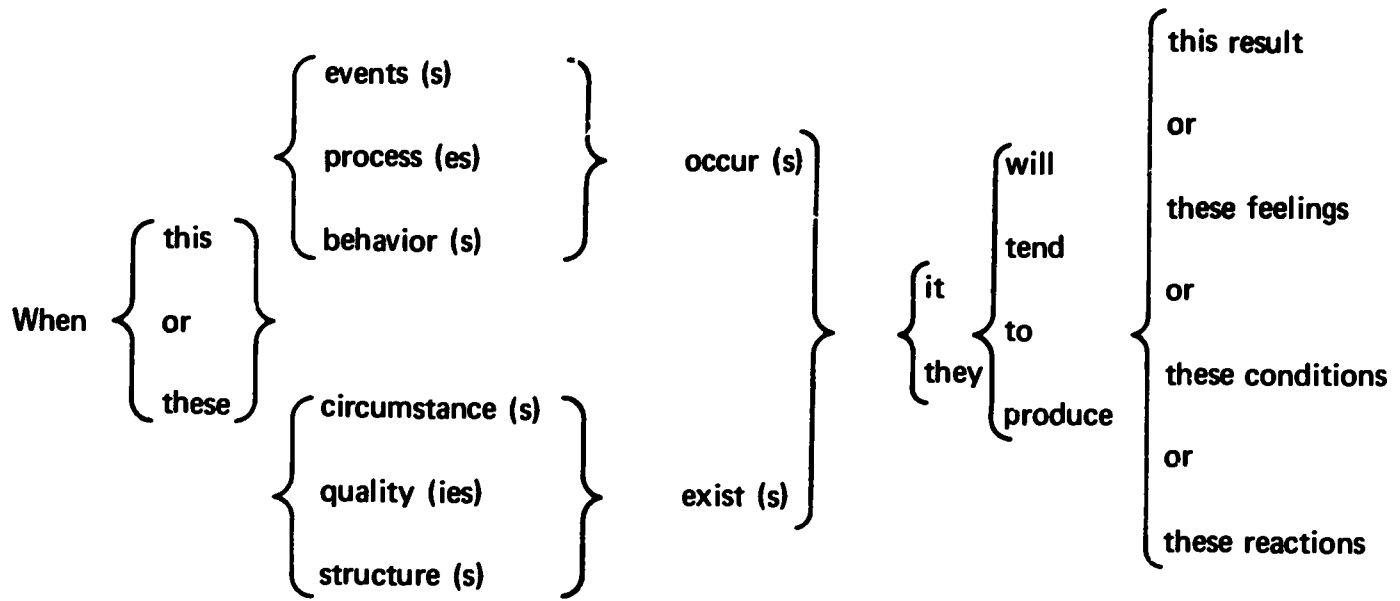


Diagram of a Process Concept

Example: When a person acts adjustively, the concepts and value judgments which mediated the act are empirically tested by the consequences of the act, and the ensuing perceived results either modify or reinforce the concept or value.

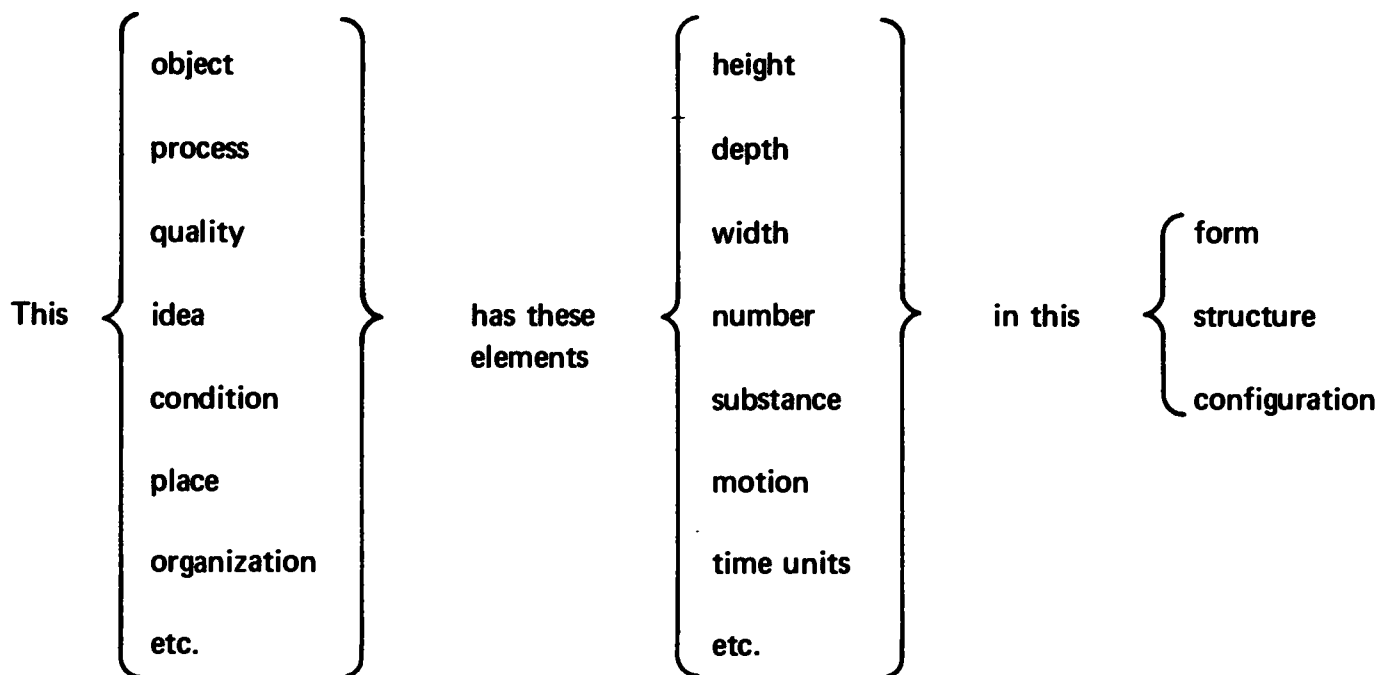


Diagram of a Structural Concept

Example: The verbal processes of instruction may include discussion of the (a) parts of a referent, (b) functions of a referent, (c) characteristics or qualities of a referent, and/or (d) the way a referent develops in assisting the learner in the formation of concepts. These elements may come in any order as long as they are not confused with each other.

them in the abstract. However, qualities operate in our thinking in the same way as structures and processes. We see them as structural entities, or we see them as processes having certain effects. "Square" is an abstract structural concept. "Kind" is an abstract process concept. Therefore, separate treatment of quality concepts is not justified.

These forms of conceptual statements are useful chiefly because they —

1. Indicate what has to be demonstrated or portrayed.
2. Guide the selection and preparation of subject matter.
3. Suggest how the verbal interaction process can be used effectively.
4. Assist in designing evaluative procedures.

Statements which are less explicit, less specific, and less definitive do not give the pointed guidance we need to sharpen teaching and make it equal to the precision demanded by the psychological principles involved.

These two forms of concept statements represent the ways in which people conceive the objects and processes that make up their interactive environment. Thus they relate subject matter directly to the controlling mental variables in human behavior, particularly to the conceptual and the decision making aspects of behavior.

This kind of conceptual statement is specific enough to enable us to identify the concepts that are critical in teaching behaviors and to concentrate on them to the exclusion of hundreds of other concepts which are not so critical in teaching. Thus, they have the added advantage of furnishing a means of setting priorities in subject matter. There is no room here to report the substantial psychological literature that makes this model of behavior attractive, but interested readers might see Bruner(7, 8), Farber and Wilson(10), Gagné and Bolles(20), Hebb(28, 29), and Woodruff (59, 63).

Subject Matter and Knowledge of Subject Matter

The intense interest of the last decade in conceptual knowledge was bound to lead to an examination of the nature and structure of knowledge. This subject has been discussed by Broudy(5); Broudy, Smith, and Burnett(6); Jenkins(36); Smith and Ennis(50); Schwab(46); and others. From a study of the several treatments, and by application of the principles involved in human behavior, the following ideas can quite defensibly be formulated.

Behaviors are literally interactions between a person and the objects and events that constitute his environment. The kind of knowledge he needs in order to engage successfully in those interacting behaviors obviously is knowledge about the objects and events with which he will interact. This infers that as we turn attention to subject matter, and to knowledge of subject matter, we must be aware that the test of the value of any item or body of knowledge is its behavioral usefulness. It is possible to identify several forms of knowledge, as will become evident in Figure 3. The various

forms are not equally useful for teaching purposes. Therefore, it will be useful to know what those various forms of knowledge are and their possibilities and limitations with respect to teaching and learning and to the modification of behavior.

Broudy and others have pointed out that knowledge is about something. It is also clear that people act on their knowledge whether it is valid or not. Since knowledge is about something and presumably is most useful when it is veridical or valid rather than illusory and invalid, we can appropriately set up a continuum that begins with the perceivable nature of environment, moves on to the first products of perception, then on to the conceptual structures that become mediating variables in behavior, and then on to the verbalized forms in which we record knowledge and engage in communication. This continuum has been put into a model by Woodruff (Figure 3).

The lowest level in the continuum consists of objects and events in the environment, which give rise to percepts. The percepts give rise to concepts. The concepts mediate adjustive behaviors, and they also give rise to verbalizations of themselves. The verbalizations are recorded in books or uttered orally. Verbal versions of knowledge can be put into the form of topical structures, taxonomies, lists of facts, soliloquies, generalizations, conclusions, admonitions, and so on. Each of those forms is useful for some purpose. In those forms they may be meaningful to others who have a conceptual background similar to the one who formulated and uttered them, but not to the learner who does not yet have that background. Knowledge in these verbal forms has traditionally been introduced into schools as subject matter for students to study, with all the attending difficulties which are inevitable when that is done. By virtue of that usage, these verbal forms of information have become substitutes for the referential forms of objects and events. Perception is not possible under such circumstances. Conceptual development can occur only if the learner already has an adequate body of perceptual inputs.

Finally, from the conceptual and symbolic levels of knowledge, we construct symbolic systems (e.g., mathematics and logic) to represent both real entities and concepts. Those systems, when they are internally logical and sound, can be used to perform logical operations consisting of a move from a set of premises to a conclusion without bothering to visualize or recall the environmental entities represented by the symbols. This is a highly useful level of knowledge, provided it maintains fidelity to the real world from which it was derived.

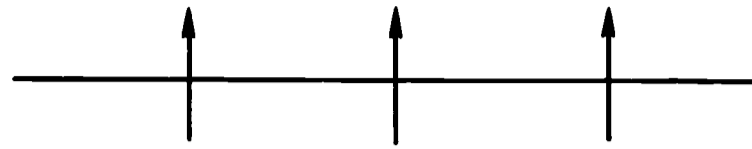
These symbolic operations can be learned completely apart from the ideas they represent; but when this is done, their users never know whether they are using the operations appropriately or inappropriately with reference to some real phenomenon or problem. A common example is the misuse of statistics in research.

The attack on the acquisition of concepts can be made at any level in the continuum, but not with equal success for all persons. The human being normally gets his usable conceptual knowledge by entry at the level of

Symbolic Strategy
Form
Level 4

Devices for skipping across the steps between
a set of premises and a valid conclusion,
remaining in the symbolic mode

Logic
Statistics
Logic Level



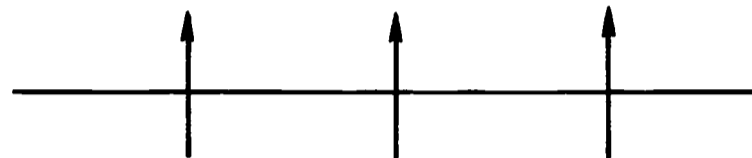
Symbolic
Form
Level 3

Verbalizations of both kinds of concepts in
the form of:

- Oral descriptions
- Written descriptions in these forms:
 - Anecdotal
 - Definitional
 - Topical-Taxonomic



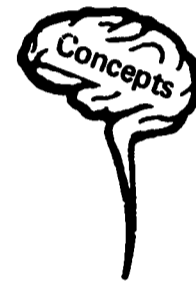
Book Level



Conceptual
Form
Level 2

Mental Constructs, in the form of:

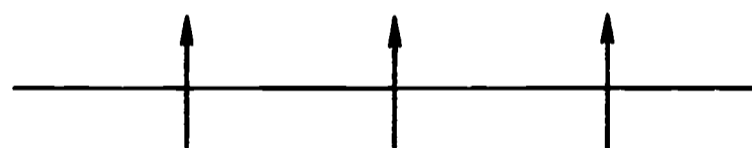
- Generalized object categories
(Generalizations)
- Functionally related sets of events seen as
total processes with their consequences
(Principles)
- Qualities abstracted from their objects and
events



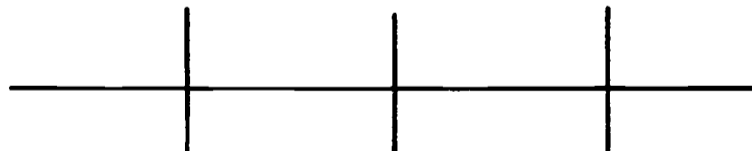
Brain Level



Concrete Concepts of objects, events, and con-
sequences



Perceptual organs and processes acting as input
channels



Referential
Form
Level 1

OBJECTS engaged in EVENTS which have
CONSEQUENCES that impinge on the SELF
and affect its SENSE OF WELL-BEING



Tree Level

Figure 3. Continuum of Subject Matter and Knowledge (59)

direct perception and by moving up into conceptual structures of his own making. He can profit by entry at the level of verbal reports from others, but only (as has been noted) when he brings with him a sufficient background of perceptual inputs to enable him to respond meaningfully to the propositions and judgments expressed in the verbal reports of others.

As suggested earlier, knowledge can be set up in various forms and for various purposes. Some of these possible forms are —

1. Anecdotal and representational portrayal of real objects and events (stories, logs, pictures, models, etc.).
2. Taxonomies of objects, events, and data (outlines, index systems).
3. General conceptual structures used for classifying like objects and events (conceptual categories and generalizations).
4. Principles derived from observing processes and their consequences (propositional or if-then statements).
5. Symbol systems governed by logical rules (technical jargon, dictionaries, formulas, mathematics, logic).
6. Conclusions and admonitions based on observations, not revealing the basis of their formulation (instructions, rules, value statements).

Learners may put their knowledge into any or all of these forms. This project takes the position, however, that an individual's learning must begin with the perceptual input process, at or near the level of anecdotal and representational portrayal of real objects and events; and that each learner moves up to the other levels only from his own store of inputs and by means of his own thought processes. When he is forced to respond to verbal levels (those beyond level 1) without the appropriate background, he resorts to verbal memorization in the absence of the capacity to comprehend. He can be effectively stimulated to think and organize at any one of the advanced levels only when he is already near that level in his own thinking, and the stimulus materials assist him in achieving a useful ordering of his existing elements of knowledge. If he is pushed into that activity without possessing the essential elements of perceptual knowledge, he can do little more than learn the verbal forms of expression and repeat them at the seemingly appropriate times.

The Conditioned Variable

Conditioned instrumental behavior patterns provide the person with capabilities for instant and effective instrumental actions of a fixed form, specific to a given situation. An act is instrumental when it is productive of something that is wanted. These behaviors, then, are the implementing competencies that enable a person to carry out his decisions and to execute his adjustive responses to situations.

As in the case of concepts, conditioned behavioral patterns must also be clearly identified for educative purposes and made the objectives of specific instructional units.

Behaviors can be spoken of in a variety of ways. One can name a

behavior (e.g., sawing), or name one or more qualities that should be present in it (e.g., efficiency), or refer to it in terms of one of its outcomes (e.g., earn a living). None of these kinds of statements is very helpful for planning instruction. A statement which gives direction to lesson planning is needed. For this purpose, the criteria proposed by Mager(40) are helpful, because they leave no ambiguity or doubt as to the behavior that is wanted or how well and under what conditions it is to be performed. These explicit elements in the statement of a behavior help the teacher lay out his plan of teaching, select his materials, and guide the participation of students in an efficient attack on the behavioral objectives.

A behavioral objective, however, can consist of a single operant to be produced by operant conditioning or a more complex and total behavior which is a combination of both conceptual and operant elements. It is useful to turn for a moment to the latter before completing the discussion of the more specific behaviors known now as operants or chained operants.

It is becoming steadily clearer as we work with the concept of an instructional objective — and especially in the light of our new insights into the nature of human behavior, the nature of subject matter, the nature of knowledge of subject matter, and the manner in which a knowledge of subject matter affects the behavior — that socially and personally significant behaviors should be used as our chief units for planning both the curriculum and each instructional unit in it.

This is because our major educational goals are stated as large and general behaviors, and there can be a direct and uncomplicated progression from the many single behavioral objectives at the lesson level to the large behavioral goals of American education as a whole. This has never been true of a curriculum made up dominantly of information, which has relatively little power to produce any set of behaviors. If we are really concerned about using the educative process to change behavior, then a direct attack on behavior is logical, economical, and unambiguous; and it is certainly sounder from a psychological position than a curriculum of information or even of concepts which are not subsumed under significant behavioral goals.

Both concepts and information find their best justification in their roles as contributing variables to the adjustive behaviors we wish to cultivate. Thus, the use of behavioral objectives provides a socially valid way of putting defensible priorities on both concepts and verbal information, both of which should be included when the behaviors require them, and excluded when they have no behavioral value.

All adjustive behaviors are a composite of conceptual elements and conditioned instrumental competencies, operating together. The processes involved in acquiring concepts have already been noted.

The acquisition of conditioned instrumental behaviors is accomplished by a set of psychological dynamics different from those employed in conceptual learning. Perception, concept formation, then concept-guided trial is the order of conceptual learning. This can be referred to as "learning

for doing." In operant conditioning, trial and reinforcement is the order, with purely incidental formation of concepts about the act one is acquiring. The concept of the act which develops as the act is being practiced does not exert a directive influence on the act. It merely enables the actor to be aware of what he is doing. This is an accurate description of what is appropriately called "learning by doing." The act is mediated by less intellectual and more specific S-R bonds between the stimulating situation and the response.

When one possesses an extensive repertoire of both concepts which function in decision making to choose goals and lines of action, and instrumental competencies ready for use in carrying out intentions, he is ideally prepared to cope with life. Education should assist students to acquire both, in their most effective relationships, and of the kinds that enable people to behave as our general educational goals suggest. Some of the contributors to our knowledge in this area are Skinner(48), Holland and Skinner(33), Ullman and Krasner(55), and Lindsley(37).

Objectives

What has been said earlier implies that objectives, both for teacher education and for public education, will be significant life behaviors to be acquired through education. For any given life behavior deemed important enough to include in the curriculum, there will be the two chief components: concepts and instrumental overt action patterns. The data and vocabulary related to them should be assumed to be included where they fit appropriately.

Input Processes, Teaching Materials, and Media

In the large sense, the overall paradigm of teaching as a total process exhibits two mutually supporting functions. One is providing a perceptual input from the environment to the student's internal storage and organizing system. The other is helping the student utilize all the stored input he possesses to acquire comprehension and general performance capability. The first is perception, and the second is conception and usage. We have dealt with the second. Now we must turn to the first.

Input is a sense-channel process. It operates on direct sensory contact with actual objects or events, or with adequate portrayals of those objects and events. Language does not qualify for this function, since it is a symbolic system which only "stands" for that which is transmitted to the mind through perception. Language becomes useful when there is something in the mind to be represented, and not before.

This view of the input process clearly implies that one of the main functions of teaching materials is to activate perception. To do that, materials must be able to speak directly to the senses in one of the several forms of sensory language. One need only ask what kinds of stimuli the various senses are capable of receiving to find the basis for an unequivocal set of specifications for teaching materials which are intended to

activate perception of one's environmental surroundings.

Perception can be activated by real things or by vivid and accurate portrayals of those things or of their important elements. Portrayals of such phenomena are "media," and they many times outnumber the real things we can use in school. The current heavy emphasis on the use of media in teaching has grown out of two facts. Educators are now being deluged with evidence of the vital importance of the perceptual process as the foundation for conceptual learning. Furthermore, the number and kinds of media available for teaching are increasing phenomenally and are providing rich resources of a highly valuable kind.

Media come into the instructional paradigm at the point where an instructional objective has been identified and its requirements in both perception and conceptual activities have been recognized. The materials to be used to activate those two vital phases of learning must then be provided, and much of that provision in the future will be in the form of nonverbal media, especially for the earlier years of one's development. However, it cannot be assumed that the perceptual function served by media can be disregarded at the higher academic levels. It becomes vital whenever any additional referential input is needed for a concept which is being developed, and this situation occurs far more frequently in college level courses than is usually recognized. This is not to mention the excellent uses of media as aids in stimulating concept formation, where they are often highly superior to undiluted lecture which omits the many possible ways of portraying organizing schemes for coping with percepts and other bodies of information. The possibilities of media for enlivening conceptual learning are almost endless.

Teaching Processes

As the final section of this chapter, a word needs to be said about planning for teaching, arranging the content of an instructional unit, and working with a student or a class.

The first two are components of the task of preparing instructional units. Assuming the use of behavioral objectives with their conceptual, operant, verbal, and informational contents, one of the teacher's essential competencies is the planning of an effective unit of instruction. This includes (a) formulating an objective in a form which gives pointed guidance to lesson planning, (b) identifying and obtaining the materials needed for achieving that objective, (c) ordering all of the materials into a program that facilitates learning, and (d) administering the plan to students.

The stating of objectives has already been discussed, as has the relationship between an objective and its supporting materials. The art of programing a unit is one of the vital competencies of a teacher, and it must be deliberately cultivated in preservice teacher education programs.

To be orderly in the pursuit of an objective does not imply the imposition of an arbitrary and stiff set of steps on the learner. The order

that is needed is one that is empirically fruitful, that makes progress easy rather than difficult, that enables the learner to take one manageable step at a time, and that enables him to take those steps in a sequence which lets him use his accomplished steps in making his next steps. The principles for doing this may be found in the studies of human behavior and of the nature of knowledge, already cited. The task of putting those principles to work in teacher education courses falls on the faculties of teacher education institutions.

The final comments pertain to the classroom teaching behaviors by which students are directed in their learning activities. Here we are concerned with the teacher's use of verbal strategies and other forms of influence directed at students.

If one starts with the assumption that the student must do his own learning, then the teacher's role must be delimited in such a way that it does not intrude on the student's learning activities. If one regards the teacher's role as consisting largely of guiding the learner's attention while the learner performs all of the acts which constitute learning, it then becomes relatively easy to identify productive teaching behaviors. There are many ways of guiding attention, and these are recognized in the literature on the interaction process. Reference should be made to such writers as Flanders(14, 15, 16), Hughes(34), Bellack(3), Smith(49), Smith and Meux(51), Aschner(2), and Halpin and Croft(27), to mention only a few.

It is also helpful to note that it is educationally profitable for the teacher to offer this kind of help at each of the phases of the student's cycle of learning actions: perception, concept formation, decision making, adjustive execution of his decisions, and interpretation of the feedback from those trials.

Outline of Proposed Preservice Professional Content

On the basis of the preceding analysis of the factors related to learning, an effort has been made to organize material into a tentative pattern of five areas. At this time, only those elements have been considered which are common to all prospective teachers within the context of the school as a social institution, with particular emphasis on teaching. Certain ideas related to differentiation by level and subject, and assumptions about the purposes of general and specialized education, will be presented later in this report.

The sequence attempts to follow the elements of perception and differentiation, organization and reorganization of conceptual structures, exploration of alternatives, and opportunities for tryout and feedback outlined in the learning process. Teaching activities have been utilized as the integrative element for the structure of the content. Since the outline is rather brief and in an early stage of development, certain content considered essential by the reader may appear to be omitted. Faculties would do well to review content from three major sources: (a) the disciplines of philosophy, sociology, psychology, history, etc.;

(b) research in communication, teaching and teaching behavior, media, group processes or dynamics, learning, development, etc.; and
(c) empirical sources and experiences for additional or revised content. A persistent problem is the identification of the competencies and concepts to be included as essential at the preservice level or in graduate study in education.

The areas outlined do not include all of the material for a given topic. At this time, the content has not been put in the form proposed earlier, nor have specific behavioral objectives been stated. The outline represents a beginning effort to organize a body of knowledge that is considered appropriate preservice professional subject matter for teachers. The selected sources and brief descriptions of the content of the sources are included as illustrations and to identify the area and the type of content being considered.

2. THE FIVE AREAS

Area I: Analytical Study of Teaching

The content outlined for this area gives major emphasis to the perceptions and assists the prospective teacher in differentiating the elements perceived. The material is based on two major assumptions: (a) the teacher education student has a limited concept of teaching, and (b) the content of the several sections will extend his conceptual scheme.

The analytical approach through concrete material is designed to increase the ability of the prospective teacher to identify and relate the variables involved in teaching. The systematic study of the teaching process and the environment for teaching provides a substantive basis for concept formation.

Behaviorally the prospective teacher should be able to apply aspects of the several analytical techniques to a given teaching example and explain or demonstrate the meaning and significance of the concepts identified.

A. A Concept of Teaching

Suggested source: Smith, B. Othanel, and Ennis, Robert H. Language and Concepts in Education. Chicago: Rand McNally & Co., 1961. 221 pp.

The material to be developed in this section provides an opportunity for the teacher education student to begin to organize his prior concepts of teaching before he attempts to employ selected analytical techniques. Smith has developed the following definition: "Teaching is a system of actions intended to induce learning." To explicate this concept of teaching, the following model is employed. (See Figure 4.)

The three categories selected are well established in the behavioral

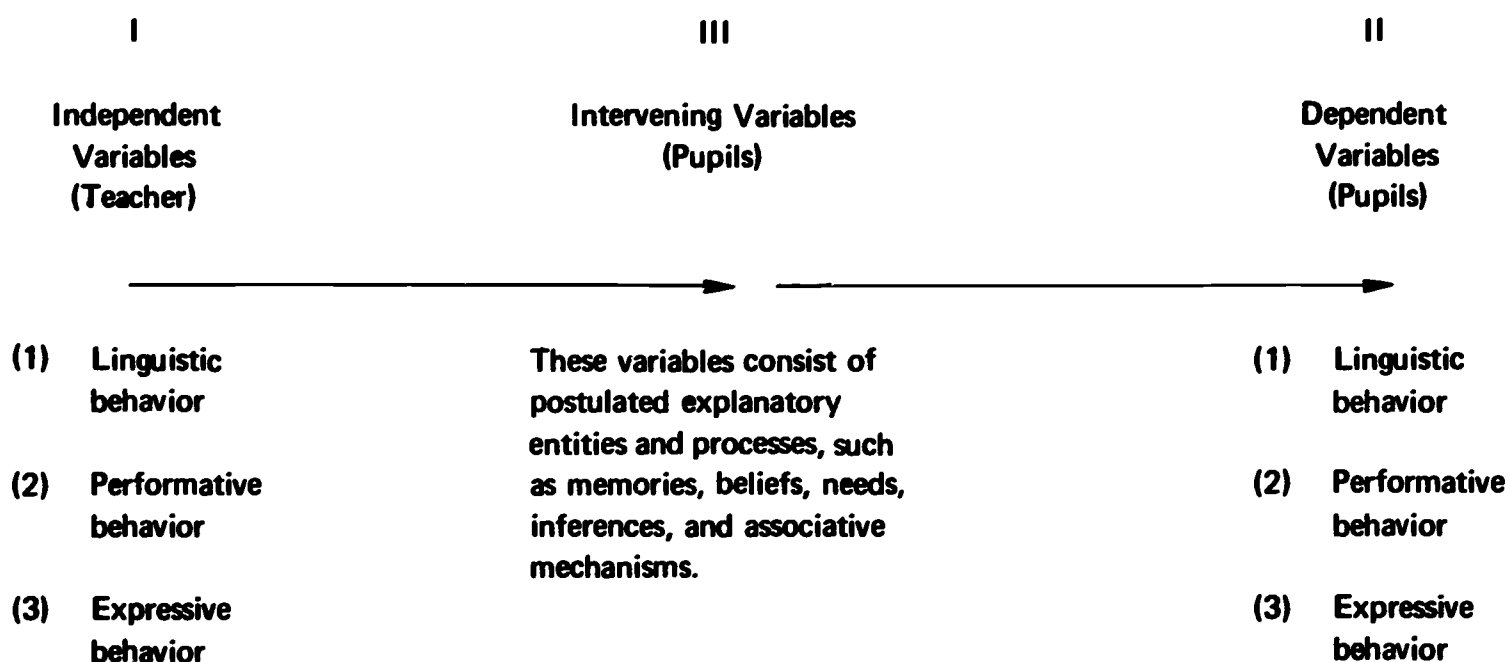
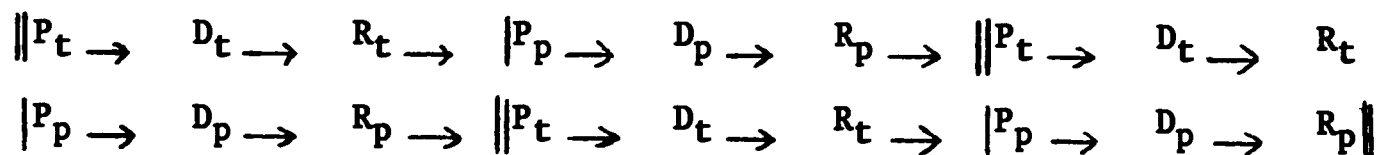


Figure 4. A Pedagogical Model

sciences: independent variables, dependent variables, and intervening variables. Smith believes that all of the variables involved in and related to the actions which make up teaching can be placed in these three categories. The arrows indicate the direction of causal influence. The actions of teaching are independent variables. Learning is an intervening variable which indicates its presence through pupil behavior which is a dependent variable.

The model does not indicate the ebb and flow of teaching or a complete schema of the cycle of giving or taking instruction. Smith represents the teaching cycle symbolically as follows:



—————> achievement, where P_t is the teacher's perception of the pupil behavior; D_t is the teacher's diagnosis of the pupil's state of interest, readiness, knowledge, and the like, made by inference from the behavior of the pupil; and R_t is the action taken by the teacher in light of his diagnosis; where P_p is the pupil's perception of the teacher's behavior; D_p is the pupil's diagnosis of the teacher's state of interest, what he is saying, and so on, as inferred from the teacher's behavior; and R_p is the reaction of the pupil to the actions of the teacher. Double vertical lines mark off instances of the complete cycle; single vertical lines divide the cycle into acts of teaching, $|P_t \rightarrow D_t \rightarrow R_t|$, or acts of taking instruction, $|P_p \rightarrow D_p \rightarrow R_p|$.

B. Paradigms, Models, or Schema for Teaching

Suggested sources: Gage, Nathaniel L., editor. Handbook of Research on Teaching: A Project of the American Educational Research Association. Chicago: Rand McNally & Co., 1963. 1218 pp.

Maccia, Elizabeth Steiner; Maccia, George S.; and Jewett, Robert E. Construction of Educational Theory Models. (U.S. Office of Education Cooperative Research Project 1632.) Columbus: Ohio State University, 1963. 334 pp.

The purpose of studying paradigms and providing opportunities to develop individual diagrams is to assist the student in delineating a number of the variables involved in teaching and in expressing the possible relationships between the variables. Some of the paradigms presented by Gage are basic only to research designs, but many of the models on teaching should assist in extending the student's perception. The individual efforts of the teacher education student in diagraming and describing the representations of teaching or of specific subareas should indicate the dimensions of the student's conceptual structures.

The work accomplished at The Ohio State University gives emphasis to the development of educational theory and may be a little advanced for the beginning teacher education student. The critical study by Elizabeth Maccia, "The Conceptions of Models in Educational Theorizing," includes some of the same models introduced by Gage but provides a different type of analysis.

If Bruner's idea of "Iconic Representation" (9) is employed, the teacher education student should begin to discover certain areas in which he needs additional knowledge. The use of diagrams is not intended to exclude the oral and written descriptive material that expresses relationships. It is included to help the student refine and sharpen his own thinking concerning the relationships between the many variables in teaching and learning.

C. Concepts from Research in Teaching

Four approaches to the study of teaching are suggested from the increasing number of research reports available. The studies represent different methods of analyzing the verbal content within the classroom. When the research approach is used as an assist in the formation of concepts by the prospective teacher, the significance of certain technical research problems is minimized. The techniques are employed as ways of looking at teaching.

1. Interaction Analysis

Suggested source: Amidon, Edmund J., and Flanders, Ned A. The Role of the Teacher in the Classroom: A Manual for Understanding and

Improving Teachers' Classroom Behavior. Minneapolis:
Paul S. Amidon & Associates, 1963. 68 pp.

Flanders' research is reported in a number of articles and journals. The Journal of Teacher Education(15) is one source. He has related the concepts of direct and indirect teacher influence to the social structure of the classroom in "Diagnosing and Utilizing Social Structures in Classroom Learning"(14).

Flanders' technique of interaction analysis is about as simple as can be devised and still provide a significant objective analysis of teaching. He has employed only ten categories for the classification of teacher and student talk. By recording the verbal communications on three-second intervals over a twenty-minute period of homogeneous activity and plotting the classification on a 10x10 matrix, the analysis identifies a number of teacher behaviors and the concepts of direct and indirect teacher influence. At this point, the student is not expected to be highly competent in analysis. A guided application of the technique to a number of videotape recorded or filmed teaching situations, which provide contrasts of teaching styles, should assist the prospective teacher in forming concepts on teaching. These should also help as he plans how he will use his authority as a teacher and how he will approach the responsibilities of teaching. In addition, the technique of interaction analysis will increase the power of the prospective teacher in live observation situations and provide a basis for self-evaluation when actually teaching.

2. Pedagogical Moves and Teaching Cycles

Suggested source: Bellack, Arno A., and Davitz, Joel R., in collaboration with Kliebar², Herbert M., and Hyman, Ronald T. The Language of the Classroom: Meanings Communicated in High School Teaching. (U.S. Office of Education Cooperative Research Project 1497.) New York: Institute of Psychological Research, Teachers College, Columbia University, 1963. 200 pp.

The verbal interaction between teachers and students may also be analyzed in terms of the various kinds of meanings communicated in the classroom. Bellack and his associates defined the basic unit of discourse as a pedagogical move. Four types of moves have been described (3, pp. 6-7).

1. Structuring moves serve the pedagogical function of focusing attention on subject matter or classroom procedures and launching interaction between students and teachers. They set the context for subsequent behavior or performance, but do not elicit a response and are not in themselves direct responses.
2. Soliciting moves are designed to elicit a verbal response, encourage persons addressed to attend to something, or elicit a physical response. All genuine questions are solicitations, as are commands, imperatives, and requests.

3. Responding moves bear a reciprocal relationship to soliciting moves and occur only in relation to them. Their pedagogical function is to fulfill the expectation of soliciting moves. Thus, students' answers to teachers' questions are classified as responding moves.
4. Reacting moves are occasioned by structuring, soliciting, responding, or another reacting move, but are not directly elicited by them. Pedagogically, these moves serve to shape or mold classroom discourse by accepting, rejecting, modifying, or expanding what has been said previously.

Within each pedagogical move, four functionally different types of meanings are communicated by teachers and pupils in the classroom: (a) substantive meanings, (b) substantive-logical meanings, (c) instructional meanings, and (d) instructional-logical meanings.

The moves occur in cyclical patterns and combinations. A teaching cycle begins either with a structuring move or with a soliciting move which is not preceded by a structuring move. For analysis, a cycle ends with the move that precedes a new structuring or soliciting move.

The prospective teacher will not be expected to become skilled in Bellack's analytical technique, but the concepts of pedagogical moves and cycles should be a part of the prospective teacher's conceptual scheme of teaching.

3. Logical Aspects of Teaching

Suggested source: Smith, B. Othanel. Logical Aspects of Teaching. Urbana: University of Illinois.

Smith has used the notion of teaching episodes, which he defines as the one or several exchanges which comprise a completed verbal transaction between two or more speakers. Episodes are made up of three parts: an opening phase, a continuing phase, and a closing phase. On the basis of the typescripts used in his research, Smith decided to develop categories on the basis of entries. The nature of the identified entries leads to the designation of logical demands and operations.

The entries Smith has identified are as follows: defining, describing, designating, stating, reporting, substituting, valuating, opining, classifying, comparing and contrasting, conditional inferring, and several kinds of explaining — mechanical, causal, sequent, procedural, teleological, and normative. Verbal actions by the teacher that do not have a logical basis are classed as directing and managing behaviors (51, Ch. 3).

Productive teacher behavior in the logical operations requires the facility of language and knowledge of facts, concepts, and principles which comprise an area of instruction and the rules and abilities to handle the logical operations. The content for professional education developed from Smith's research would attempt to relate the language and knowledge with the rules and abilities.

4. The Concept of Teaching Strategies for Cognitive Development

Suggested source: Taba, Hilda; Levine, Samuel; and Elzey, Freeman F. Thinking in Elementary School Children. (U.S. Office of Education Cooperative Research Project 1574.) San Francisco: San Francisco State College, 1964. 207 pp.

While the multidimensional analysis employed by Taba is well beyond the level expected of the typical beginning teacher, certain very important concepts such as focusing, extending, and lifting can be extracted and verified by the analysis of selected films, tapes, and transcripts of classroom discourse. In addition to the study of questions asked by teachers and answers given by students, particular attention should be given to Taba's idea of "a teaching strategy which includes a rotation of learning tasks, calling for the assimilation of new information into the existing conceptual scheme with information that requires an extension and reorganization of the scheme."

Taba's research has focused on the teaching strategies and materials necessary for the development of thinking. Her research brings to the foreground some critical areas and the relationships between the areas of teacher competence, materials development, and the cognitive tasks identified with the development of critical thinking.

Taba gives particular attention to the questions a teacher asks. She states that "the role of questions becomes crucial, and the way of asking questions is by far the most influential teaching act. A focus set by the teacher's questions circumscribes the mental operations which students can perform, determines which points they can explore, and which modes of thought they learn" (53, p. 53). Questions also "determine the degree to which heterogeneity of perception and of cognitive skills can be accommodated" (53, p. 54). Her description of a teaching strategy is as follows:

The level of thought attained seems to be determined by the whole pattern of transactions: the particular combination of focusing, extending, and lifting; the timing of these acts; the length of time spent on a particular focus, such as exploring specific descriptive information before examining causes or attempting exploration; the distance between the mental operations of the students at the moment from the level required by the teacher, and the points at which the teacher seeks information from students and gives it. These combinations, not merely the frequencies alone, constitute a teaching strategy.

In one report, Taba has stated three interesting process concepts to be employed in the development of content for preservice professional education:

1. When the teacher attempts to raise the level of thought very early in the discussion, this typically results in the children returning to a lower level and in their inability to sustain discussion at the higher level of thought.

2. When there is a constant change of focus, the children's thought alternates between several levels, is not sustained at the higher level, and gradually stabilizes at the most primitive one.
3. When the teaching strategies pay little attention to creating models for thinking, children tend to acquire faulty or unproductive conceptual schemes with which to organize information or solve problems.

D. Nonverbal Communication in the Classroom

Suggested sources: Hall, Edward T. The Silent Language. New York: Doubleday & Co., 1959. 240 pp.

Galloway, Charles M. An Exploratory Study of Observational Procedures for Determining Teacher Non-verbal Communication. Dissertation. Gainesville: University of Florida, 1962.

The preceding analyses have been based on the verbal interaction in the classroom. Of equal importance are the multiple, simultaneous, and often contradictory nonverbal communications within a given teaching-learning situation.

Nonverbal communication, which may be classified as controlling or as positive or negative affective teacher behavior, is also evident and may be studied within this context. Many of the personal characteristics of the teacher also have communicative elements. Galloway has categorized the nonverbal actions of the teacher as (a) enthusiastic support, (b) helping, (c) receptivity, (d) pro forma, (e) inattentive, (f) unresponsive, and (g) disapproving.

The nonverbal communications of the students to each other and to the teacher are equally important. The teacher often uses these data as the basis for inferences regarding the students' understanding, motivation, or intentions.

Hall's concept of culture as a communication system, and the proposition that culture not only determines what is to be learned but also how one goes about learning, have particular meaning for the prospective teacher in the public schools of the United States, where a wide variety of possible teaching assignments exists. The structures developed by Hall provide a valuable basis for the analysis of messages transmitted by non-verbal means. Since the nonverbal communications of the teacher, students, materials, and environment of the classroom, school, and community are of major importance, the study in this area should be designed to increase the awareness and sensitivity of the prospective teacher to these factors in teaching and learning.

E. Assessment of the Social-Emotional Climate in Classrooms

Suggested source: Withall, John. "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms." Journal of Experimental Education 17: 347-61; March 1949.

The technique developed by Withall provides a basis for a reasonably objective study of the social-emotional climate of the classroom. The assumptions of his research were "(a) that the social-emotional climate is a group phenomenon, (b) that the teacher's behavior is the most important single factor in creating climate in the classroom, and (c) that the teacher's verbal behavior is a representative sample of his total behavior" (57, p. 347).

Social-emotional climate is considered to represent the emotional tone which is concomitant with interpersonal interaction. Operationally defined, it is considered to influence "(a) the inner private world of each individual, (b) the esprit de corps of a group, and (c) the sense of meaningfulness of group and individual goals and activities, (d) the objectivity with which a problem is attacked, and (e) the kind and extent of interpersonal interaction in a group" (57, p. 349).

Withall classified 200 teacher statements (typical classroom period) into seven categories, three of which were teacher-centered, three learner-centered, and one neutral. The climate index was based on a ratio of learner-centered statements to teacher-centered statements. The teachers' statements are classified as follows (57, p. 349):

1. Learner-supportive statements that have the intent of reassuring or commending the pupil.
2. Acceptant and clarifying statements having an intent to convey to the pupil the feeling that he was understood and help him elucidate his ideas and feelings.
3. Problem-structuring statements or questions which proffer information or raise questions about the problem in an objective manner with intent to facilitate learner's problem solving.
4. Neutral statements which comprise polite formalities, administrative comments, verbatim repetition of something that has already been said. No intent inferrable.
5. Directive or hortative statements with intent to have pupil follow a recommended course of action.
6. Reproving or depreciating remarks intended to deter pupil from continued indulgence in present "unacceptable behavior."
7. Teacher self-supporting remarks intended to sustain or justify the teacher's position or course of action.

F. A Study of the Classroom Group as a Social System

Suggested source: Getzels, J.W., and Thelen, Herbert A. "The Classroom Group as a Unique Social System." The Dynamics of Instructional Groups. Fifty-ninth Yearbook, Part II, National Society for the Study of Education. Chicago: University of Chicago Press, 1960. Chapter 4, pp. 53-82.

This particular reference was selected as a source for professional content because the authors have identified specific issues for analysis and have provided "A Conceptual Framework for the Study of the Classroom Group as a Social System," Figure 5.

The authors systematically develop the model (23, p. 65), beginning with a concept of —

the social system as involving two classes of phenomena which are at once conceptually independent and phenomenally interactive. First, there are the institutions with certain roles and expectations that will fulfill the goals of the system. Secondly, there are the individuals with certain personalities and need dispositions inhabiting the system, whose observed interactions comprise what is called social or group behavior.

Behavior is expressed as a function of the "nomothetic" or normative dimension of the social system (institution, role, and expectation) and the idiographic or personal dimension of the social system (individual, personality, and need-disposition). Symbolically the relationship is expressed " $B = f(R \times P)$," where B is observed behavior, R is a given institutional role defined by the expectations attaching to it, and P is the personality of the particular role incumbent defined by his need-dispositions" (23, p. 69).

The basic model for a social system is expanded by adding supportive elements to each of the dimensions, establishing the class as a social system, and relating the individual to the classroom group situation. The complex model is shown in Figure 5.

Getzels and Thelen(23, p. 80) state —

Within this framework, this then might be conceived as the ideal-type model of the classroom as a social system: (a) Each individual identifies with the goals of the system so that they become part of his own needs. (b) Each individual believes that the expectations held for him are rational if the goals are to be achieved. (c) He feels that he belongs to a group with similar emotional identifications and rational beliefs.

A model such as this and the basic concepts identified and employed in the development offer significant content for preservice teacher education.

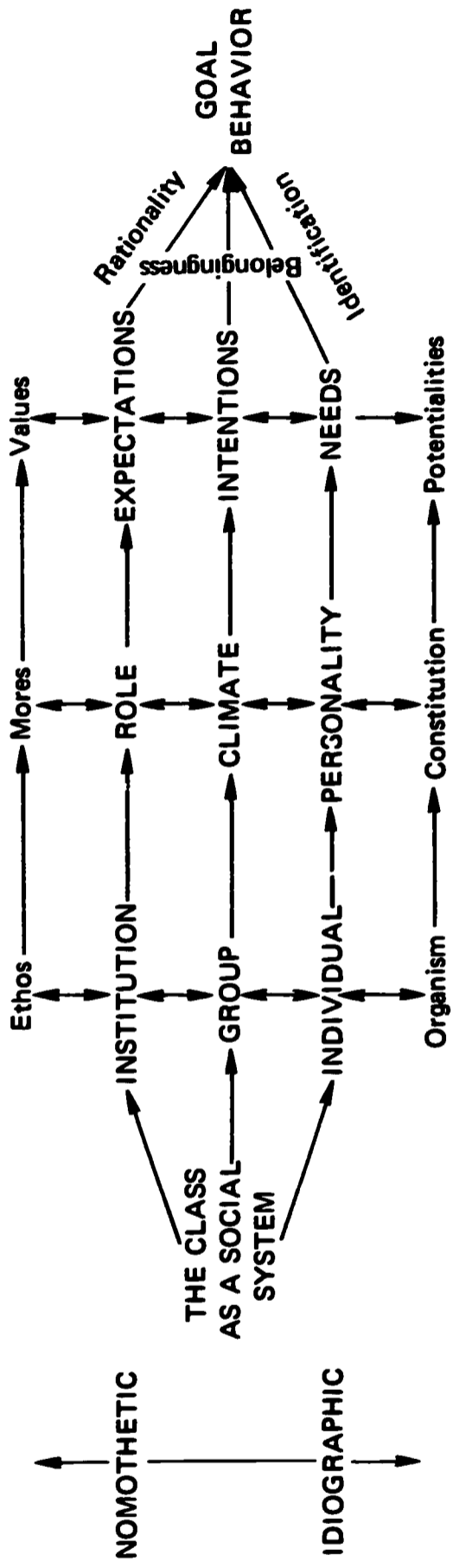


Figure 5. The Class as a Social System (23, p. 80)

G. Nature of Leadership Style

Suggested source: Jenkins, David H. "Characteristics and Functions of Leadership in Instructional Groups." The Dynamics of Instructional Groups. Fifty-ninth Yearbook, Part II, National Society for the Study of Education. Chicago: University of Chicago Press, 1960. Chapter 8, pp. 164-84.

Concepts of the leadership, authority, power, and influence may be developed through a study of how these elements are used by the teacher in the classroom. Since "the authority of the teacher does not arise from the instructional group but from the school as an organization within the community, strategies for the effective use need to be developed" (35, p. 165).

Jenkins defines the terms as follows (35, pp. 164-7):

Leadership is behavior which affects the instructional groups.
Authority is the ability to make decisions which affect other people.
Power is the capability of augmenting or impeding need satisfaction.

"The teacher has two essential functions as leader: (a) creating conditions in the classroom so that work can be accomplished and (b) organizing work activities so that the appropriate learnings may be achieved" (35, p. 171). The uses of authority and power by the teacher are the means for meeting the functions.

There are a number of other research studies on leadership that could be considered. In addition, the material on teacher characteristics and behaving styles may be adapted to analysis. The prospective teacher needs to determine a style that is consistent with the demands of the leadership responsibility and his own needs and abilities.

Area II: Structures and Uses of Knowledge

The content outlined for this area gives major emphasis to the formation of concepts basic to the logical organization of instructional content (curriculum). The new curriculum programs in the various subject areas stress the logical relations among the elements of content and also the strategic importance of certain concepts within various fields of knowledge. The public school curriculum and the logical operations employed in teaching at all levels and in all subjects require the teacher, as Smith points out, "to see knowledge as a whole — its kinds, its sources, its underpinnings, and its justifications."

Behaviorally, the prospective teacher should be able to analyze content, put elements of the knowledge in instructional form, and assess certain logical operations performed in teaching the content.

A. Determinants and Uses of Knowledge

Suggested source: Broudy, Harry S.; Smith, B. Othanel; and Burnett, Joe R. Democracy and Excellence in American Secondary Education: A Study in Curriculum Theory. Chicago: Rand McNally & Co., 1964. 302 pp.

The concepts of the prospective teacher about the uses of knowledge he will be helping his students to learn will affect the choice and arrangement of content. Broudy, Smith, and Burnett have been able to distinguish four typical uses of knowledge or school learnings in modern life. The terms used to denote the concepts are replicative, associative, applicative, and interpretive (6, pp. 46-55).

Replicative uses are those operations and contents that are used very much as learned in a wide range of frequently occurring situations. The situations are virtually self-announcing, and the school performance is used as given or learned. Also included in this area are the facts recalled as learned.

Associative uses of learnings are the near opposite of the replicative. When something learned comes to mind because it has something in common with the present situation or because of a cue, it is an associative use. The associative use is important. But as the authors stress, one of the major dangers is an over use and unrecognized substitution for logical meanings.

School learnings usually in the form of some principle, generalization, or statement are used applicatively to solve a problem or to analyze a situation. The highest applicative use of knowledge is to expand knowledge itself as in the work of the scholar and researcher. When a problem is presented that elicits the same responses that have been used many times before, the student is making a replicative rather than an applicative use of knowledge.

Interpretation is a process related to application but is far less specific and detailed. When school learnings are used to perceive, understand, or feel life situations, the use is primarily interpretative. Interpretation tends to determine which of the other uses might be made. The interpretative use of schooling is primarily for orientation and perspective rather than for action and problem solving.

An assessment of the content of knowledge on the basis of uses should extend the conceptual structure of the prospective teacher.

B. Logical Structures

Suggested source: Hickey, Albert E., and Newton, John M. The Logical Basis of Teaching: I. The Effect of Subconcept Sequence on Learning. Final Report to Office of Naval Research, Personnel and Training Branch, Contract Nonr-4125 (00). Newburyport, Mass.: ENTELEK, 1964.

The concepts of the prospective teacher of the processes of induction-deduction, analysis-synthesis, and concrete-abstract will not only affect the selection of content but how the content is handled in instruction. The research by Hickey and Newton offers a valuable source for preservice professional content. They have stated that their research —

(a) explores the structure of knowledge and the relationship between a multi-dimensional knowledge space and the one-dimensional teaching space, (b) offers several hypotheses for the transformations from the first space to the second, (c) demonstrates the results of different hypotheses using economics as subject matter, and (d) describes an experiment designed to see whether or not alternative subconcept sequences have a significant differential effect on learning.

As a part of their research, they developed "A Model of the Logic Space," Figure 6. The description of the model is as follows (31, pp. 7-9):

The bottom plane contains concrete, point-at-able events of the real world. Elemental events or phenomena are ranged along the far side of the plane; more complex phenomena (governed by natural laws) are to be found along the near side. Events in this plane are both specific and concrete.

The second plane contains more abstract representations of the specific events to be found in the concrete plane. Thus the symbol "N=2" is substituted for the two point-at-able people in the concrete plane. As in the bottom plane, however, the more elemental concepts, such as number, will be found along the far side of the plane, while the more complex phenomena, such as the expression of function, will be found along the near side.

The top plane contains generalizations of the specific concrete or symbolic examples found on the other two planes. This is necessarily an abstract level. The elemental concepts are again found on the far side, the more complex ones toward the near side.

To progress from the far side to the near side on any plane of the model is to synthesize a phenomena or concept. To go from front to back is to analyze one. The tree diagram on the top plane shows the logical combination of elements to form a complex concept. The location of a concept on the dimension simple-complex, i.e., its relative complexity, can be measured by the number of operations necessary to define or measure it. Thus, in economics, money is a simpler concept than the Law of Demand.

To progress from the bottom or middle plane to the top is to progress from the specific, even concrete, to the general and necessarily abstract. This is the process of induction. To progress from top to bottom is to progress from the general (and abstract) to the specific, the process of deduction.

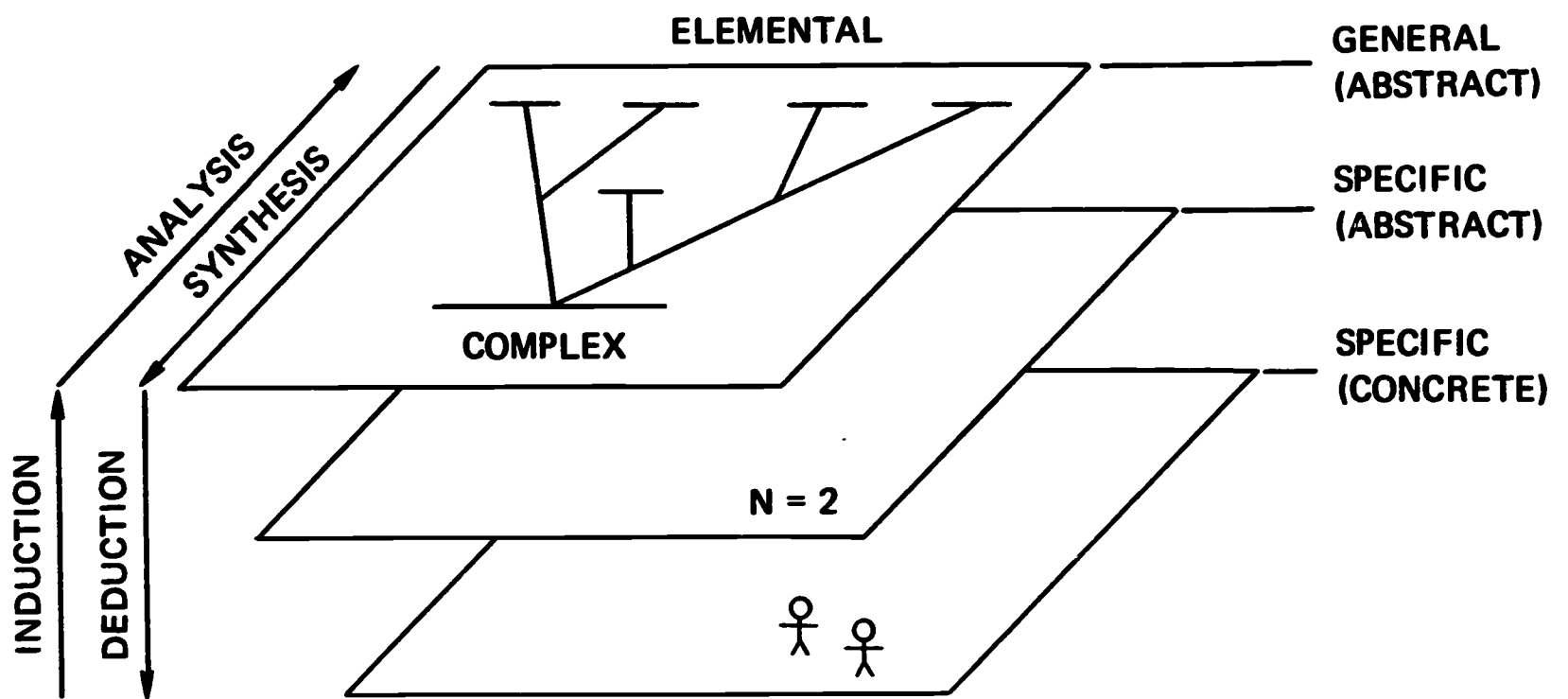


Figure 6. A Model of the Logic Space (31, p. 8)

In the vertical concrete-abstract continuum, verbal concepts are at the top, i.e., the abstract or symbolic end. The verbal statement of principle may, however, correspond to a physical or natural law at the concrete end of the continuum.

The content of instruction is within the logic space. The teacher works with subject matter within these dimensions and employs the processes and at the same time assists his students in dealing with content and processes. The model provides a basis for the critical study of instructional content.

Hickey and Newton state the problem of the teaching process as follows:

While knowledge is to be found in a space of at least three dimensions, it can be taught in only a one-dimensional sequence, since the student can attend to only one thing at a time. Constrained to this single-thread process, the essence of the teacher's problem is to weave the thread up and down, back and forth, through the knowledge space.

C. Structure and Form of Knowledge

Suggested sources: Bruner, Jerome S. "Some Theorems on Instruction Illustrated with Reference to Mathematics." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 13, pp. 306-35.

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

The work of Bruner, referred to on page 35, has provided some valuable guides or principles related to the structure of knowledge that should be considered in the preservice professional curriculum. The following is an outline developed from his material.

The structure of any domain of knowledge may be characterized in three ways, each affecting the ability of the learner to master it:

- a. Mode of Representation. Any domain of knowledge (or problem within that domain of knowledge) can be represented in three ways:
 1. Enactive representation — a set of actions appropriate for achieving a certain result.
 2. Ikonic representation — a set of summary images or graphics that stand for a concept without defining it fully.
 3. Symbolic representation — a set of symbolic or logical propositions drawn from a symbolic system that is governed

by rules or laws for forming and transforming propositions.

- b. Economy — refers to the amount of information that must be held in mind and processed to achieve comprehension. The larger the number of items of information that must be carried to understand something or deal with a problem the greater the number of successive steps one must take in processing that information to achieve a conclusion; hence, the less the economy.
- c. Effective power — The effective power of any particular way of structuring a domain of knowledge refers to the generative value of a set of learned propositions. The power of representation can also be described as its capacity, in the hands of a learner, to connect matters that, on the surface, seem quite separate.

Mode, economy, and power vary in appropriateness to different ages, to different "styles" among learners, and to the differences in subject matters. At this point in the sequence, these concepts would be developed with prospective teachers to assist them in their study of the knowledge they will be teaching. The mode of representation, economy, and power provide criteria by which content may be studied. Also at this point in the program, the concepts of sequencing instructional content for the learner should be included.

D. The Meaning of Subject Matter

Suggested sources: Smith, B. Othanel, and Ennis, Robert H. Language and Concepts in Education. Chicago: Rand McNally & Co., 1961. 221 pp.

Henderson, Kenneth B. "Uses of 'Subject Matter.'" Language and Concepts in Education. (Edited by B. Othanel Smith and Robert H. Ennis.) Chicago: Rand McNally & Co., 1961. Chapter 3.

The prospective teacher needs to have a clear concept of the term "subject matter" and criteria by which he may evaluate other definitions in current use. The varied meanings given to subject matter as expressed by both curriculum specialists and popular writers have created some confusion as to the meaning of the term.

Henderson suggests in the following statement three criteria for a concept of subject matter (30):

For a concept of subject matter to be fruitful, it should assist the teacher in at least three of his important tasks related to subject matter: (a) selecting subject matter for consideration in his classes, (b) organizing the subject matter so that there is some relation among its composite elements, and (c) evaluating the students' acquisition of the subject matter.

On the basis of these criteria, Henderson develops the concept that "subject matter is cognitive knowledge about a subject." In arriving at this concept, he differentiates between "knowing how" (non-cognitive knowledge) and "knowing that" (cognitive knowledge). Henderson suggests that cognitive knowledge or "knowing that" may be classified in the following way, for pedagogical purposes:

1. Statements (a sentence which asserts that something is the case)
 - 1.1 Analytic
 - 1.11 Singular
 - 1.12 General
 - 1.2 Contingent
 - 1.21 Singular
 - 1.22 General
2. Prescriptions (an order, directive, or command)
 - 2.1 Singular
 - 2.2 General
3. Value Statements (a statement containing a word which is used to rate or grade something)
 - 3.1 Singular
 - 3.2 General

E. Logical Aspects of Teaching

Suggested sources: Smith, B. Othanel. Logical Aspects of Teaching. Urbana: University of Illinois.

Jenkins, William A., editor. The Nature of Knowledge: Implications for the Education of Teachers. (Edward A. and Rosa Uhrig Memorial Lectures.) Madison: University of Wisconsin School of Education, 1962. 96 pp.

The idea of logical operations was introduced in the first area (page 36) as a part of the Analytical Study of Teaching. In the preceding section, the concept of subject matter and a classificatory outline of cognitive knowledge was developed. At this time, the purpose is to deal with the rules which govern the operations and structure of the operations. An understanding of the rules and structure will have a self-monitoring effect on the teacher's own behavior and will assist him in the diagnosis of the pupils' difficulties, evaluation of the text material, and selection and organization of content.

One area within this dimension is the ability of the teacher to recognize the kinds of sentences that he and his students use and that the content contains. Teachers need to understand the logical character (interpretation and use) of the following kinds of sentences: (a) value sentences, (b) definiton sentences, (c) analytic sentences, and (d) empirical sentences. In addition, there are sentences which state particulars, sentences which express generalizations, prescriptive sentences

giving directions as to how something is to be done, and counterfactual sentences which state what might have been the effect had something occurred, but which in fact did not occur.

The teacher's competence in handling the logical operations and various forms of content is a major factor in the quality of education. Intellectual rigor consists in the ability of the student to handle logical operations with marked precision and to think clearly and consistently.

F. Analysis of Content and Existing Structures

Suggested sources: Broudy, Harry S.; Smith, B. Othanel; and Burnett, Joe R. Democracy and Excellence in American Secondary Education: A Study in Curriculum Theory. Chicago: Rand McNally & Co., 1964. 302 pp.

Jenkins, William A., editor. The Nature of Knowledge: Implications for the Education of Teachers. (Edward A. and Rosa Uhrig Memorial Lectures.) Madison: University of Wisconsin School of Education, 1962. 96 pp.

Woodruff, Asahel D. "The Nature and Elements of the Cognitive Approach to Instruction." Paper, May 28, 1964. (Mimeo.)

Broudy, Smith, and Burnett state that "intelligent behavior is pre-figured by the individual's scheme of concepts and their relationships. An effective curriculum therefore includes concepts and principles which are basic to intelligent behavior" (6, p. 121). At another point, they stress the importance of concepts as "nodes in the development of cognitive networks" (6, p. 121), and use as a definition: "Concepts are foci of organization in the mental make-up of the individual, focal points in the organization of experience. In this sense, they are to be thought of as intervening conditions lying between stimulus and response" (6, p. 121).

Later in the discussion, they point out (6, p. 121):

Strictly speaking, the curriculum does not contain concepts, but rather their symbolic and operational expressions. Nor does the teacher work with concepts as such. Instead, he deals with definitions and other verbal formulations, together with materials and instruments which build concepts into the student's experience.

Within this frame of reference, Woodruff has concluded: "Curriculum building includes at least two crucial teacher actions: (a) selecting the knowledge to be taught and (b) transforming the verbal knowledge into forms which facilitate conceptual learning by students." Woodruff believes that the form of what he calls the process concept given on page 22 indicates best what is to be demonstrated or portrayed.

After the prospective teacher has been assisted in developing a concept

of concepts, he should begin to select concepts from a body of knowledge and put the subject matter in an instructional form. He should be assisted in reviewing the selected content within the larger domain of knowledge, logic space and subconcept tree, uses of the knowledge, and logical operations.

Area III: Concepts of Human Development and Learning

The content suggested for this area is designed to assist the prospective teacher in the formation of concepts basic to directing the cognitive operations of his students. Learning has been emphasized by the previous definitions: "Teaching is a system of actions intended to induce learning," and "Subject matter is cognitive knowledge about a subject." Since one of the unique purposes of schooling is its contribution to the intellectual growth of the individual learner, an understanding of learning is of major importance.

A cognitive approach appears to offer a basis for achieving the purposes of education, particularly those purposes related to critical thinking and continuing intellectual growth. In addition, modern curriculum theory and the newly developed (or being developed) curriculums which stress conceptual development require the teacher to be well grounded in cognition.

Behaviorally, the prospective teacher should be able to analyze a selected learning situation in terms of its cognitive elements and processes, differentiate between levels or modes of representation of learning, and identify cognitive tasks.

A. Structure of Intellect

Suggested sources: Guilford, J.P., and Merrifield, P.R. "The Structure of Intellect Model: Its Uses and Implications." Reports from the Psychological Laboratory, No. 24. Los Angeles: University of Southern California, 1960.

Guilford, J.P.; Merrifield, P.R.; and Cox, Anna B. Creative Thinking in Children at the Junior High School Levels. (U.S. Office of Education Cooperative Research Project 737.) Los Angeles: University of Southern California, 1961. 35 pp.

The research of Guilford and his associates in their work at the Aptitudes Research Center has produced a theoretical model of human intelligence called the "Structure of Intellect," Figure 7. The concepts and relationships presented by the model provide a transition from the structure of knowledge (content) to the study of student intellectual processes (operations).

The structure "is devised in terms of parallels among the approximately sixty known, separate abilities we have been able to define as factorially

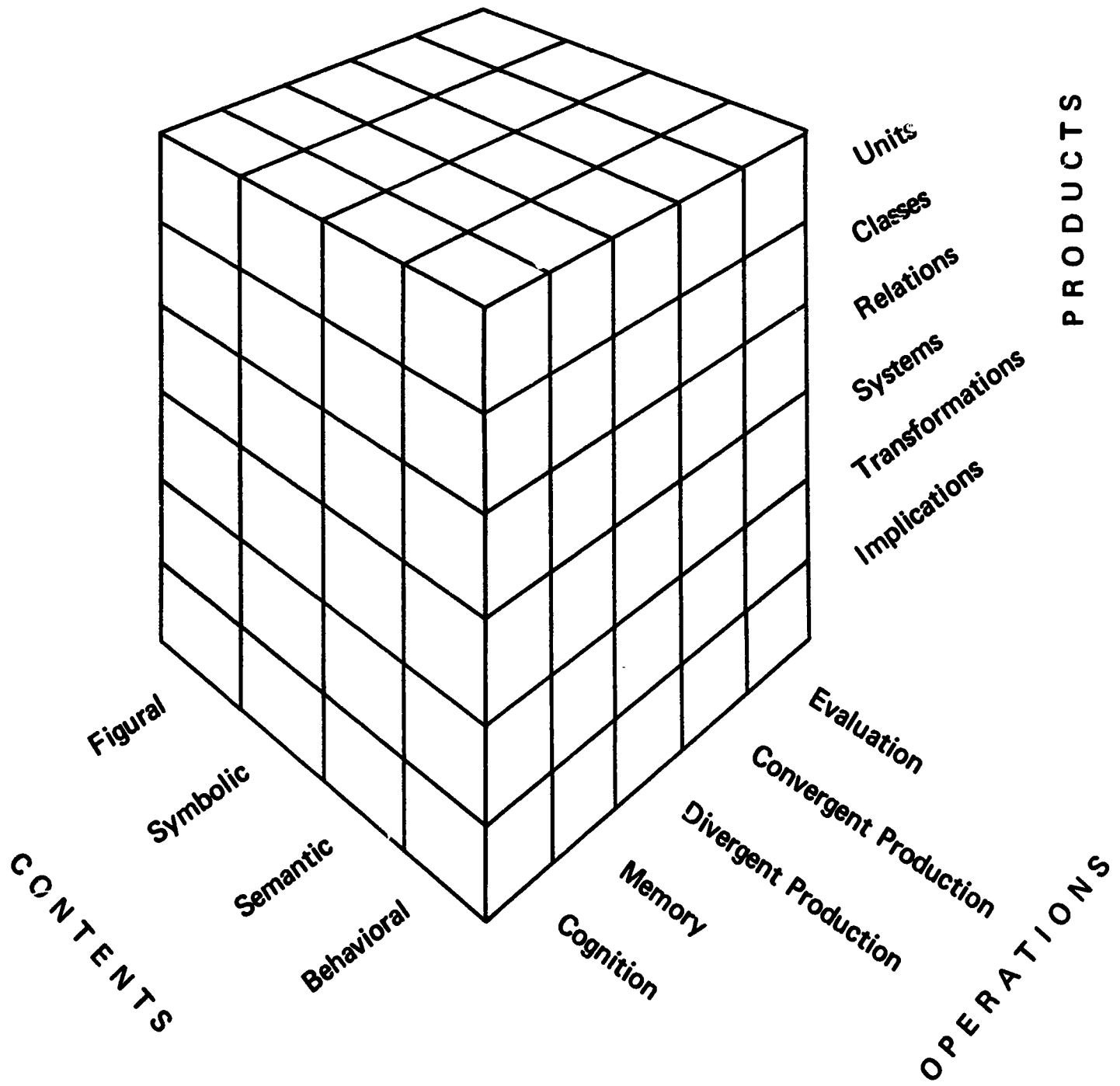


Figure 7. Structure of Intellect (25, p. 4)

distinct" (25, p. 4). The material developed from this research should assist in extending the prospective teacher's understanding of the ability factors involved in student learning.

B. Cognitive Growth

Suggested sources: Bruner, Jerome S. "Some Theorems on Instruction Illustrated with Reference to Mathematics." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 13, pp. 306-35.

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

Bruner, Jerome S. "The Course of Cognitive Growth." American Psychologist 19: 1-15; January 1964.

Mooney, Ross L. "Creation and Teaching." Bulletin of the Bureau of School Service 35: 45-62; 1963.

The modes for representing a body of knowledge — enactive representation, iconic representation, and symbolic representation, as described on page 46 — were developed by Bruner. In his article in the American Psychologist(7), he adds the relationship of the modes to learning. To illustrate the type of content to be used in assisting the prospective teacher in his development of concepts basic to directing the cognitive growth of his students, the following two paragraphs from the article are quoted (7, p. 2):

If we are to benefit from contact with recurrent regularities in the environment, we must represent them in some manner. To dismiss this problem as "mere memory" is to misunderstand it. For the most important thing about memory is not storage of past experience, but rather the retrieval of what is relevant in some usable form. This depends upon how past experience is coded and processed so that it may indeed be relevant and usable in the present when needed. The end product of such a system of coding and processing is what we may speak of as a representation.

I shall call the three modes of representation mentioned earlier enactive representation, iconic representation, and symbolic representation. Their appearance in the life of the child is in that order, each depending upon the previous one for its development, yet all of them remaining more or less intact throughout life — barring such early accidents as blindness or deafness or cortical injury. By enactive representation I mean a mode of representing past events through appropriate motor response. We cannot, for example, give an adequate description of familiar sidewalks or floors over which we habitually walk, nor do we have much of an image of what they are like. Yet we get about them without tripping or even looking much. Such

segments of our environment — bicycle riding, tying knots, aspects of driving — get represented in our muscles, so to speak. Iconic representation summarizes events by the selective organization of percepts and of images, by the spatial, temporal, and qualitative structures of the perceptual field and their transformed images. Images "stand for" perceptual events in the close but conventionally selective way that a picture stands for the object pictured. Finally, a symbol system represents things by design features that include remoteness and arbitrariness. A word neither points directly to its referent here and now, nor does it resemble it as a picture. The lexeme "Philadelphia" looks no more like the city so designated than does a nonsense syllable. The other property of language that is crucial is its productiveness in combination, far beyond what can be done with images or acts. "Philadelphia is a lavender sachet in Grandmother's linen closet," or $(x + 2)^2 = x^2 + 4x + 4 = x(x + 4) + 4$.

The significance of the successive emergence of action, image, and word as the vehicles of representation has particular meaning for the prospective teacher. The productiveness of language gives added emphasis to the logical operations presented earlier.

The concepts that Mooney has developed of "man's continuing coming to be (becoming)" and the model he has used to represent his ideas will add to the prospective teacher's concepts of growth. The diagram he has used is not included, and a brief summary of his work is difficult, but in the reference cited the model is included, and Mooney states:

Worded in a sentence, the elementary conditions for existence (life) of an organism are that it operates in a system (a) open to its environment, (b) integral of its being, (c) in transactional give and take with its environment, and (d) selectively making fresh fittings (adaptations, creations).

C. Concept Formation

Suggested sources: Woodruff, Asahel D. "The Use of Concepts in Teaching and Learning." Journal of Teacher Education 15: 81-99; March 1964.

Woodruff, Asahel D. "The Nature and Elements of the Cognitive Approach to Instruction." Paper, May 28, 1964. (Mimeo.)

Part of the content for this section was presented on pages 20 to 24 as one of the bases for the rationale of the proposed content outline of preservice professional content. Introduced earlier was the simplified model, "The Cognitive Cycle in Behavior and Learning," which included the concepts of perception, thinking, decision making, tryout, and feedback and a possible formation for conceptual statements. Woodruff has recently developed a more complex model (58) to illustrate the input of symbolic material (printed, spoken, or media) that should be added to this section.

The concept of "cultural filter" which restricts perception and thought processes that was implied in the area of nonverbal communications (page 38) should be related to the cycle. In addition, the possible roles of verbal and media stimulation in the guiding of perception, suggesting concept organization, proposing alternative acts, and evaluating effects should be included in the content of this section.

D. Cognitive Learning Styles

Suggested sources: Getzels, J.W. "Creative Thinking, Problem Solving, and Instruction." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 10, pp. 240-67.

Taba, Hilda; Levine, Samuel; and Elzey, Freeman F. Thinking in Elementary School Children. (U.S. Office of Education Cooperative Research Project 1574.) San Francisco: San Francisco State College, 1964. 207 pp.

Riessman, Frank. "The Strategy of Style." Teachers College Record 65: 484-9; March 1964.

There is a wide variety of material available in the area of critical thinking, creativity, and convergent-divergent thought. The research in these areas adds a new dimension to the concepts of individual differences.

Riessman has proposed (44, p. 485) that —

There has been much too much emphasis on the emotional approach in attempting to understand why a child doesn't learn. Little careful analysis is given to how the child's learning might improve simply by concentrating on the way that he works and learns, rather than on his affective reasons for not learning.

Taba stresses the importance of the concept of assimilation and accommodation. She concludes: "When the level of learning tasks is below the level of thought, the effect is boredom. When questions and learning tasks are too far beyond the existing levels of thought, passive or rote learning is inevitable."

One of the ideas presented by Getzels is that "the human being is not only a stimulus-reducing but a stimulus-seeking organism. He strives not only to master problems with which he is confronted but to confront problems in order to master them" (22, p. 266). Dynamic thought processes require a learning situation in which there is a balance between the known and unknown.

The material presented on cognitive growth is also related to the style of learning. The mode of representation from enactive to iconic to

symbolic and the use of language as an instrument of thought may be reconsidered from the standpoint of individual differences. If the concepts for instruction are assumed to be fairly constant, then level or form, rate, and way content is processed become the controllable variables of instruction.

Taba also offers an interesting hypothesis related to individual differences. She states: "It is possible, further, that the key to individual differences in learning may be found partially in the difference in the amount of concrete thinking an individual needs before formal thought can emerge."

E. Inquiry Training

Suggested source: Suchman, J. Richard. The Elementary School Training Program in Scientific Inquiry. (U.S. Office of Education Title VI Project 216.) Urbana: University of Illinois, 1962.

"Inquiry can be divided into four main types of actions: searching, data processing, discovery, and verification." While Suchman's research has been limited to elementary school children and a topic from physics, the processes and concepts he has employed are significant to preservice teacher education. The training may well begin in the elementary school, but it should not end there, nor should the process be restricted to the sciences.

Suchman hypothesizes that "discovery then can be thought of as the experience associated with the sudden assimilation of perceived data within the framework of a conceptual system regardless of whether this was brought about by a reorganization of the data or of the system." He stresses the fact that "there is no attempt to teach children how to invent or adapt conceptual systems." For his research this is a valid limitation, but one of the ultimate goals of education is to create an awareness and use by the individual of his conceptual system.

The issue between fostering inquiry within the various subjects taught separately or instituting new courses designated as inquiry is not specifically related to preservice professional teacher education. The teacher, without regard to organization structure, should be able to assist students in the formation of conceptual systems.

F. Readiness and Motivation in Learning

Suggested sources: Tyler, Fred T. "Issues Related to Readiness to Learn." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 9, pp. 210-39.

Sears, Pauline S., and Hilgard, Ernest R. "The

Teacher's Role in the Motivation of the Learner." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 8, pp. 182-209.

Bruner, Jerome S. "Some Theorems on Instruction Illustrated with Reference to Mathematics." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 13, pp. 306-35.

Broudy, Harry S.; Smith, B. Othanel; and Burnett, Joe R. Democracy and Excellence in American Secondary Education: A Study in Curriculum Theory. Chicago: Rand McNally & Co., 1964. 302 pp.

Readiness and motivation are complex concepts that are somewhat controversial, and the specific concepts and subconcepts for the preservice professional education are difficult to isolate. However, concepts of readiness and motivation that are consistent with cognitive learning are essential to the prospective teacher. Curriculum development and the selection of teaching strategies demand that decisions be made, but the bases for the decisions have been or are being changed as new understandings of readiness, motivation, learning, and the structure of knowledge are developed.

Tyler indicates, on the basis of an inconsistency, that Bruner may have overstated his position on readiness when he proposed that "the foundations of any subject may be taught to anybody at any age in some form" (54, p. 210). But the other extreme of a fixed age for a specific learning is equally, if not more, inadequate.

Broudy, Smith, and Burnett introduce a logical and content structural dimension to the concept of readiness. They also express the idea that a variation in method and materials may be employed in teaching the same concept at various age levels. The notion that many concepts are dynamic rather than static will also affect the prospective teacher's concept of readiness.

Many of the present concepts of motivation are also based on methods and materials that minimize the belief that "the human being is a stimulus seeking organism." The evidence of the interest generated by the content of the newer curriculum approaches may provide valuable concepts of motivation for the prospective teacher.

G. Evaluation of Learning

No particular source has been designated for this section. The area of evaluation is highly developed, and the basic problem will center on selecting the minimum essential concepts and skills required of the

prospective teacher for effective evaluation.

The sequencing and adaptation of content to levels will influence the selection of concepts of evaluation. The concepts underlying the ungraded school, both elementary and secondary, will also need to be considered. Another source will be the development of tests in cognition and processes in problem solving.

Area IV: Designs for Teaching-Learning

The content suggested for this area is designed to refine, extend, and integrate the concepts of the teaching process, structures of knowledge, and cognitive learning presented on the preceding pages. The area may be considered as a putting together of concepts to be tried out and evaluated.

At this time, the teacher education student looks at a problem within a domain of knowledge and its demands for learning, for the learner, and for the teacher in order to attain the defined purposes. This is an empirical testing of the concepts previously developed. The prospective teacher is assessing the adequacy of his cognitive scheme for teaching. The area deals with the formulation and answering of basic instructional questions.

Behaviorally, the prospective teacher should be able to develop a learning experience designed to assist children and youth in the formation of concepts.

A. Teaching Strategies

Suggested sources: Taba, Hilda; Levine, Samuel; and Elzey, Freeman F. Thinking in Elementary School Children. (U.S. Office of Education Cooperative Research Project 1574.) San Francisco: San Francisco State College, 1964. 207 pp.

Smith, B. Othanel. Logical Aspects of Teaching. Urbana: University of Illinois.

As an introduction to this area, a brief review of the idea of a teaching strategy that has been developed by Taba and presented on page 37, and a brief review of the logical operations developed by Smith and listed on page 36, are suggested. The review is designed to reinforce the earlier conception of a teaching strategy that attends to (a) the nature of the specific objectives, (b) relevant learning principles, (c) structuring of content, (d) learners, and (e) interactions.

Taba has defined teaching strategies as the patterns and combinations of teaching acts. She states:

These strategies were conceived as consciously formulated plans for

bringing about particular behavioral changes in students. Such plans are translated into conditions and activities of learning, arranged into sequences according to both the logical requirements of the learning tasks and the psychological requirements of the learners. While some aspects of the strategy are predetermined, others evolve in response to diagnosed learning problems as the interaction between students and the teacher evolves.

B. Learning Unit Design

Suggested source: Woodruff, Asahel D. "The Nature and Elements of the Cognitive Approach to Instruction." Paper, May 28, 1964. (Mimeo.)

The design presented in the introduction on page 19 as a guide for the development of the preservice professional content would be the basic source for concepts in this section. The concept of Woodruff's "Elements of an Instructional Unit" is stated below:

A learning unit in a specific problem area develops an interactive relationship among content which is expressed as concepts, symbol and verbal patterns, and performance abilities for the desired behavioral objectives; learning processes which involve perception, restructuring and thinking, decision making, tryout and feedback, memorization, and practice of overt acts; and materials in the form of real referents, media or diagrammatics for portraying referents, means for recalling past acquired perception, tryout situations or simulations, related verbal materials, and/or practice situations.

As the prospective teacher begins to formulate a design for teaching-learning, the relationships among content, learning, and materials may be conceptualized by the model. At the time content is being studied for selection, the nature of the learning involved is also being assessed, and supportive materials are being considered.

The teaching strategy may be considered as superimposed upon the design or outlined in a fourth column. The purpose of the content in this section is to stress the interdependence among content, learning materials, and the strategy for teaching.

C. Formation of Objectives

Suggested sources: Bloom, Benjamin Samuel, editor. Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain. New York: Longmans, Green and Co., 1956. 207 pp.

Mager, Robert F. Preparing Objectives for Programmed Instruction. San Francisco: Fearon Publishers, 1962. 62 pp.

In the foreword to Mager's book, Gilpin raises three obvious but fundamental questions for instruction (40, p. vii):

1. What is it that we must teach?
2. How will we know when we have taught it?
3. What materials and procedures will work best to teach what we wish to teach?

Within a given content or subject area there is a relative significance, as well as an order, to the "what to teach." The way of teaching a particular content is also to be considered.

Mager suggests that three questions be asked of the prepared statements of objectives to test their clarity and completeness:

1. Does the statement describe what the learner will be doing when he has demonstrated that he has reached the objective? (40, p. 14)
2. Does the statement describe the important conditions (givens and/or restrictions) under which the learner will be expected to demonstrate his competence? (40, p. 26)
3. Does the statement indicate how the learner will be evaluated? Does it describe at least the lower limit of acceptable performance? (40, p. 44)

The Taxonomy of Educational Objectives edited by Bloom(4) provides a basis for the prospective teacher to look at the objectives within the larger construct of the cognitive domain. A concept of the relationship of the specific objectives to a larger scheme should assist in the development of a design.

D. Instructional Systems

Suggested source: Lumsdaine, A.A. "Educational Technology, Programed Learning, and Instructional Science." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 16, pp. 371-401.

The development of designs for teaching-learning requires that the prospective teacher recognize the potential and use of all the elements of an instructional system. Earlier in this paper a media or instructional system was defined as the optimal integration of the demands of communication, learning, and content. The broad definition includes within its elements all of the newer media, textbooks, teachers, learners, content, purposes, etc., as factors.

To achieve an integration of the several elements, concepts of the function and power of the individual parts should be achieved. There is a

progressive "if-then" quality to be considered. If these are the demands, then this is the potential of a particular combination of elements and factors.

The basic manipulative concepts related to such factors as recorders, projectors, and other media may now be achieved with self-instructional program materials in a laboratory-type situation. Basic skills in the use of equipment make it possible to give added emphasis to the power of a particular medium or media in combination for the teaching-learning situation being designed.

E. Programed Instruction

Suggested sources: Markle, Susan Meyer; Eigen, Lewis D.; and Komoski, Kenneth. A Programed Primer on Programing. Volumes 1 and 2. New York: The Center for Programed Instruction, 1961.

Gagné, Robert M. "The Analysis of Instructional Objectives." Paper, 1963. (Mimeo.)

Lumsdaine, A.A. "Educational Technology, Programed Learning, and Instructional Science." Theories of Learning and Instruction. Sixty-third Yearbook, Part I, National Society for the Study of Education. Chicago: University of Chicago Press, 1964. Chapter 16, pp. 371-401.

Programed instruction is given a special section, because in its simplest form there is an absolute demand for an integration of the elements of communication, learning, and content. The prospective teacher should not only know the basic concepts of programing, but also should program a limited amount of instructional material in one of the content areas he is planning to teach.

Area V: Demonstration and Evaluation of Teaching Competencies*

The use of media systems and selected direct experiences within the preceding area will have provided a number of actual and simulated teaching situations. The content suggested for this area is designed to provide a more critical assessment of the behavioral competencies of the prospective teacher.

The proposed approach takes advantage of the fact that a large number of teacher behaviors have been previously identified and assumes that other behaviors will be identified by future research. More adequate classifications of teacher behaviors are becoming available through research. The

* This aspect of the proposed preservice professional education content is being developed further by the AACTE Media Project.

demonstration of specific competencies in a number of carefully selected behavioral areas in different teaching situations could assure a desired beginning level of teaching.

The prospective teacher should demonstrate his competence in a number of behaviors or behavioral areas, evaluate the demonstrated competence, and plan for effective improvement.

A. A Review of Teacher Behaviors

Any effort to group teacher behaviors by categories tends to minimize the complexity of teaching and the interrelationships of the behaviors. A grouping also leaves out the interaction among content, learners, and other factors related to teaching. However, a listing of behaviors within these limitations can prove valuable in designing experiences for the demonstration of competence. The following is one classification and listing:

1. Behaviors related to teaching activities:

defining	opining	directing and managing
describing	classifying	classroom
designating	comparing and contrasting	questioning
stating	conditional inferring	demonstrating
reporting	explaining (mechanical)	guiding
substituting	explaining (causal)	diagnosing
valuating	explaining (sequent)	order-maintaining
	explaining (procedural)	record-keeping
	explaining (teleological)	interacting
	explaining (normative)	assignment-making
		admonishing
		counseling
		advising

2. Behaviors as pedagogical moves or phasing (the ordering, timing, length of time spent on one or the other move or phase, and the relationship to the behavior listed above should be considered):

structuring	focusing	opining	activating exploration
soliciting	extending	continuing	maintenance of exploration
responding	lifting	closing	direction of exploration
reacting			

3. Behaviors related to learning processes:

motivation-producing	drawing inference from data
perception-directing	guiding perception
response-eliciting	suggesting concept
reinforcement-providing	organization
generating cognitive operations	suggesting action
integrating bits of information	evaluating effects

generating independent methods of
inquiry
stimulating creative use of knowledge

assisting differentiation,
grouping, labeling
applying principles

4. Information processing behaviors:

sensing, identifying, and classifying information inputs

evaluating potential courses of action in light of pupil behavior,
domain involved, the content information communicated, and the
information form and channel consistent with the intended uses of
the information

decision making, involving the selecting of appropriate information
content and appropriate transmission channels or media

programing, or the logical-psychological ordering and arranging of
the intended information input

transmission of appropriate information via appropriate channels

5. Influence behaviors:

direct

lecturing
giving directions
criticizing and justifying
authority

indirect

accepting and clarifying feelings
praising and encouraging
accepting and using ideas of students
asking questions of procedure

teacher perceived behavior
student perceived behavior

6. Controlling behaviors:

structuring
regulating

standard setting
judging

7. Positive and negative affective behaviors:

supportive
solicitous
encouraging
tension producing

admonishing
reprimanding
accusative
threatening

8. Response behaviors:

meeting requests
clarifying
interpreting

expanding
ignoring

9. Communicative behaviors:

verbal

nonverbal
direct
nondirect

10. Information-processing behaviors:

motivating-reinforcing
presenting-explaining-demonstrating
organizing-planning-managing
evaluating
counseling-advising

11. Out-of-class instructional related behaviors:

planning and organizing
selecting, controlling, and sequencing content
selecting media and materials
determining and stating behavioral objectives
designing tryout experiences for learners

12. Behaviors related to personal characteristics:

pattern (x) warm, kindly, understanding, friendly, vs. aloof,
egocentric, restricted

pattern (y) responsible, businesslike, systematic, vs. evading,
unplanned, slipshod

pattern (z) stimulating, imaginative, surgent, vs. dull, routine,
unimaginative

democratic	forceful, anxious	encouraging manner
autocratic	turbulent, impulsive, variable	critically evaluative
directive	self-controlling (consistency,	manner
nondirective	structuring, routine, orderliness)	displaying interest
		cultural value related

13. Out-of-class school-oriented behaviors

interpreting
cooperating
supporting

B. Selecting and Planning Trial Experiences

The specific behaviors to be demonstrated may vary by individual teacher education students, levels of teaching, and subject matter areas. Competencies may be demonstrated in one or all of the behaviors in at least three different ways:

1. problem solving or testing

2. simulation techniques
3. specific direct classroom experiences

The use of the term "specific" in relation to the classroom situation is meant to give added emphasis to the dimension of teacher behavior to be demonstrated. Teacher competencies become the criteria, rather than time.

The direct experience situation must include more than one behavior, but a careful recording will make it possible to critically study each.

This approach to selecting behaviors to be demonstrated will probably require the prospective teacher to work in several different classrooms and schools, rather than one. The approach will require a reassessment of the requirements established for the selection and use of cooperating schools and teachers as well as the role of the college supervisors. The plan is an attempt to move the direct experience closer to a type of internship.

C. Analysis of Demonstrated Competencies

Actually this is a part of the preceding area. It is presented separately to give emphasis. The evaluative criteria and techniques are inherent in problem solving or testing and simulation techniques. In the specific classroom situations, the demonstration should be recorded in some way. The portable videotape recorder offers many possibilities in this area. The audiotape recorder can be effectively used for a number of behaviors, such as the logical operations and the concepts of focusing, extending, and lifting.

The prospective teacher must be an active participant in the analysis. The techniques employed in the first area should be expanded to provide an adequate analytical basis.

D. Theories of Instruction and Teaching

Suggested sources: Maccia, Elizabeth Steiner; Maccia, George S.; and Jewett, Robert E. Construction of Educational Theory Models. (U.S. Office of Education Cooperative Research Project 1632.) Columbus: Ohio State University, 1963. 334 pp.

Ryans, David G. "An Information-System Approach to Instruction with Special Reference to the Teacher." Address given at the annual meeting of the American Educational Research Association, Chicago, Illinois, February 13, 1963. Santa Monica, Calif.: System Development Corporation, SP 1079, 1963.

After some of the added trial experiences and analyses, the prospective teacher should be introduced to the work in theories of instruction. The introduction should provide a basis for continuing development.

E. The Professional

The student by this time has demonstrated his competence as a beginning teacher. He is, or is very nearly, eligible to begin practice. In addition to his classroom and individual school responsibilities, he becomes associated with a large group of other professionals working in one of the largest of the social institutions. As a professional he is confronted with an array of crucial issues. His preparation in general education, specialization, and professional education becomes the basis for a critical analysis of the issues and their meaning to the society at large, children and youth, the schools, the profession, and himself.

3. SUMMARY

The long title of the TEAM project, A Project to Improve the Professional Sequence in Pre-Service Teacher Education Through the Selective and Planned Use of New Media, required the development of an instructional systems concept. The ideas within the title establish a man-machine relationship. Media, as a product of technology, both assumes and requires an operational structure for effectiveness. One way to deal with a system is through a model.

In each phase of the project, the staff utilized one or more models; but near the end of the original project period, a simplified model of an organized teaching-learning situation which was applicable to a school-level teaching-learning situation and which would also serve as a guide for the planned use of new media in teacher education was developed. The new model was an effort to bring together (a) relevant research about teaching, (b) recent advances in learning theory, and (c) improvements in instructional technology.

The major assumptions for the system were as follows: (a) organized instruction takes place in an environment, (b) the purposes of instruction are definable, (c) there is a relevant body of content, (d) learning processes are operational, and (e) communication in some form is required.

On the basis of these assumptions, the operational definition was considered to be: An instructional system provides an optimal interdependent relationship among the components of content, learning, and communication within an environment for a defined purpose (or purposes). Using this definition, the simple instructional system may be represented diagrammatically as shown in Figure 8, which was developed by Herbert F. LaGrone in connection with the project.

There are some dangers in the simplification of complex phenomena such as teaching and learning, but the features of a modeling approach soon bring to attention the missing components and/or elements of the subject under investigation. A model only approximates reality in a representational form but serves to stimulate and organize thinking about the real situation.

Omitted from the simplified model are (a) teacher or teacher substitute,

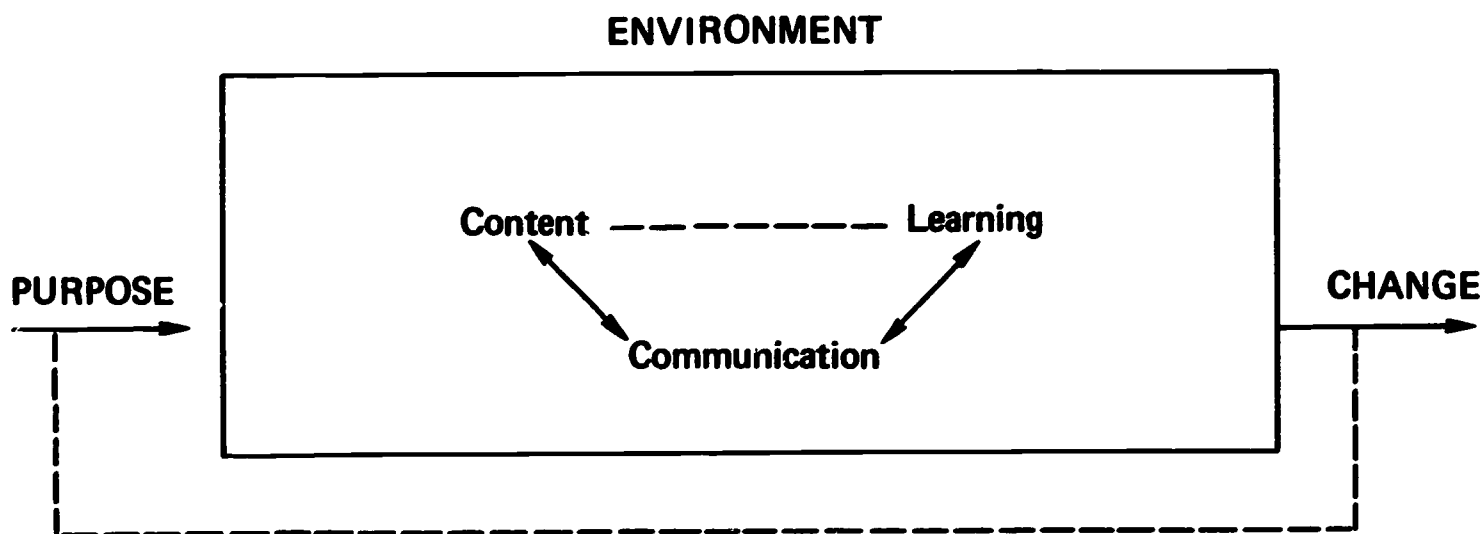


Figure 8. Simple Instructional System

(b) learner and his unique attributes, and (c) media and their characteristics. Each is considered as an element of each of the components and is operational within the environment. Some may wish to reverse the use of the terms component and element. As used by the staff, component is more abstract and inclusive, whereas element is more concrete and serves as a determinant.

To illustrate the simple teaching-learning situation model, two extremely different examples may be used. One would show Mark Hopkins on one end of a log with his pupil on the other studying some aspect of nature, and in this case, would assume that Mark is using silence as a communications form. The other example would show a student working at a remote terminal in Palo Alto, California, on a gas law problem, using an inquiry design controlled by a computer in Poughkeepsie, New York. A concern for the relative merits of the two situations should not obscure the noting of the components of environment, purpose, learning, content, and communication. And in each case, there was a teacher, learner, and media operating on and within the system.

A particular model, as a model, should not and is not intended to be overly stressed. As previously mentioned, the value of any model is its use as a guide to thinking about a given subject or problem. The model does provide some temporary freedom from rigid definitions.

Since the TEAM project assumed in its first report that teachers select alternatives or make choices, and that these actions are based on some conceptualization of a teaching-learning situation, a model should assist in or serve as the basis for the development of some of the purposes of a preservice professional teacher education program.

Considering teaching as decision making requires the formulation of behavioral objectives which may be generalized and also related to the intellectual development of the prospective teacher. Influenced by this particular approach, the TEAM project staff developed five major behavioral objectives along a hierarchical continuum of human intellectual processes. The prospective teacher with an adequate conceptual scheme and analytical competence will have an increased sensitivity and awareness of the variables

operating on and within the teaching-learning situation.

INTELLECTUAL PROCESS

BEHAVIORS

**Observation or
Recognition**

**Identify significant variables
inherent in a variety of teaching-
learning situations**

**Differentiation or
Discrimination**

**Define and/or describe the
dimensions of the variables**

Analysis

**Explore the organization and
interdependent relationships of the
variables**

Synthesis

**Integrate and/or relate the
variables within redefined teaching-
learning situations**

Invention

**Identify other variables and
relationships**

The systems model and objectives led to the development of the curriculum presented earlier in this report. The curriculum may be summarized in a catalogue description form as follows:

I. Analyzing Teaching.

An analytical approach to the study of teaching; the teaching process and the learning environment; analytical techniques; perceptions and perceptive elements; concepts of teaching; variables and schematic combinations; teaching examples and demonstrations for analysis.

II. Structuring Knowledge.

The formation of concepts basic to logical organization of instructional content; structures of knowledge; kinds of knowledge; analysis of content; strategical planning and logical operations in the structure and form of knowledge.

III. Conceptualizing Learning.

The formation of concepts basic to directing cognitive operations; critical thinking; processes of learning; analysis of learning situations; cognitive elements and processes; cognitive tasks.

IV. Designing Teaching-Learning Models.

The synthesis of teaching, learning, and content concepts; testing and evaluating; assessing the adequacy of cognitive schemes to defined purposes; the formulation and answering of basic instructional questions; developing and testing learning experiences; teaching strategies.

V. Evaluating Teaching Strategies in Action.

Selected direct experiences; actual and simulated teaching situations; critical assessment of behavioral competencies through the analysis of teaching.

The TEAM Project Dissemination Report II presented current uses of new media in teacher education. The report had two parts: (a) multimedia display which illustrated how some twenty colleges and universities were currently using new media in teacher education, and (b) a brochure in which the properties of the new media were organized to provide unique applications for teacher education. The report was designed to show how some institutions were using new media to improve their designated objectives and to suggest some possible general applications. The following summarizes the emphasis of Dissemination Report II.

USES OF THE NEW MEDIA IN PROFESSIONAL TEACHER EDUCATION

A new conceptual framework for teacher education utilizing the power of the new media to relate content and learning processes.

The properties of the new media make possible a completely new and different approach to the study of teaching and the curriculum for professional teacher development by:

Extending Human Capacities — The limitations of human sight, hearing, attention, and concentration in the study of teaching are reduced by magnification, amplification, selectivity, and isolation. Deficiencies of recall and interpretation are minimized by authenticity, reproductivity, and simplification of observed phenomena.

Providing New Content — The whole of teaching experience becomes available by the removal of the limitations imposed by time, space, and distance. Replication, collation, integration, and authenticity make not only new but a new kind of relevant content available for study.

Interrelating Existing Content — The observation, demonstration, and participation activities in the preparation of the prospective teacher reach higher levels of efficiency and pertinence. Concurrent interrelated observations (simultaneity) of acts of teaching and acts of learning are better related for more effective teacher development.

Increasing Learning Potential — Perception may be expanded, tryout situations simulated, and feedback provided by a variety of new media. Automaticity, immediacy, and variation increase the possibilities for meeting individual differences and special interests of teacher education students.

The display has been prepared to illustrate some of the current uses of the new media in professional

teacher education. The uses of the colleges and universities presented are intended to be representative rather than inclusive. There are other possibilities and many of the member institutions of the AACTE are utilizing the new media in a variety of creative programs.

The model, objectives, curriculum, and related media applications were not presented as a complete solution to the problems of teacher education. Collectively the materials are a way of bringing recent research, learning, and technology together and approaching the problem. The selective and planned use of new media for the improvement of the professional sequence of preservice teacher education demands an analytical approach, and the TEAM project was an example. If the new media are to be used effectively, the users must answer the "for what?" and "why?" questions for themselves. The media used must be an integral part of planning rather than an adjunct to an established operational design.

The TEAM project gave emphasis to the conceptual development of the prospective teacher and criteria such as (a) content relevance, (b) inter-relatedness, (c) internal consistency, and (d) potential for effective media utilization in the development of objectives and curriculum. These and other criteria will need to be considered by faculties in planning.

The outline is being submitted for a critical review in the field. The review is expected to test the logical and psychological bases for selection and organization, as well as to locate omissions and unnecessary inclusions.

Part III

1. IMPLICATIONS OF THE PROPOSED PRESERVICE PROFESSIONAL EDUCATION CONTENT

Before considering some of the implications of the proposed preservice professional education content, the position statements about the approach should be reconsidered.

1. Teaching demands that teachers make a variety of choices.
2. The teacher's concepts within a conceptual scheme are the basis for his actions.
3. A given domain of knowledge may be represented enactively, iconically, and symbolically. The body of knowledge may be characterized by its representation, economy, and power.
4. The organization of knowledge and instruction requires an assumption about learning.
5. The usual course of intellectual development moves from enactive through iconic to symbolic representation. Concept formation and development may also be considered as beginning with perceptual intake, and involving differentiation, organization, decision making, tryout, and feedback to intake.
6. The forced fitting of the preservice professional content of a program of teacher education among the existing structures of the subdivisions of the broad field of education voids the possibilities for representation and reduces the economy and power of the content to a very low level.
7. The professional component of a program of teacher education should be concerned primarily with the body of knowledge that is demanded of the prospective teacher, rather than the knowledge required of other college graduates.
8. The effective organization and sequencing of a body of knowledge requires an integrative, centralizing, or focusing element. For the preservice professional content of a program of teacher education, this

element can and should be the classroom function of the teacher.

9. The effective employment of media in teacher education and teaching is dependent upon clarity of purpose and assumptions about learning and content.

The preceding professional content outline is a beginning effort to meet the requirements of these position statements. Both the statements and effort need a critical review.

Implications of the Proposed Content

All of the implications or the full significance of the changes in content being proposed have not yet been explored. If the direction of change is correct and a major change in curriculum is possible at this time, some of the problem areas to be considered are the following:

A. Materials

Most current instructional materials will not meet the demands of the proposed professional curriculum. In the main, materials now in use have been developed within the dimensions of the structures of the subdivisions of the field of education.

To realize the potential of the proposed content outline, new materials that capitalize on the potential of the concept of an instructional system approach will be needed. A task of this magnitude would be difficult, but far from impossible. The basic body of knowledge is available, and the necessary advances in technology are known.

B. Staffing

The present personnel in teacher education have the basic preparation and experience necessary for the preservice professional program. On first review, the proposed content outline appears to favor a team teaching approach and to give emphasis to the generalist rather than specialist. However, a more careful study indicates that one of the staff problems will be that of reorientation. The personnel now qualified for instruction in the psychological foundations area should be qualified for the content outlined as Concepts of Human Development and Learning. The social foundations staff should have adequate preparation for the area designated as Structures and Uses of Knowledge. The curriculum, methods, and student teaching staff, with the help of media personnel, should be effective in the Analytical Study of Teaching, Designs for Teaching-Learning, and Demonstration and Evaluation of Teaching.

Since the proposed content outline applies different criteria for structure and is somewhat more highly organized than the existing plan for the preservice professional program, there is a possibility of conflict

between the teacher educator's teaching assignment and his personal research and specialization interests. The possible conflict of interest may in time prove to be less than anticipated, because the revised approach will generate a new research potential which should challenge the specialist.

The quality of the instructional materials developed should assist in the solution of such staffing problems that may arise. Another possibility for minimizing staff problems would be regional arrangements.

C. Institutional Organization for Instruction

Problems of organization will vary with the size and scope of the total program of a given institution. In the small college or university concerned only with the preservice level of preparation, the proposed content outline will not present new organizational problems. In the larger institutions, the outline favors the identification of a unit designed to foster and coordinate the institutional concern for preservice professional education.

One possibility for the large institutions would be the use of the present departmental structure at the graduate level for staff assignments to foster research and specialization, and at the same time the assignment of personnel with a high preservice teacher education interest to work in teacher preparation. The arrangement would be very similar to the present plan for using the subject specialist in preservice professional preparation.

D. Facilities and Equipment

The proposed content outline will increase the demands for facilities and equipment. The effective development and use of media will demand a variety of media and their housing. At this time, space and funds for equipment may prove to be one of the more serious problems in many institutions. The content supports a need for laboratory space for rather specific purposes. Such usage will minimize flexibility of space.

The videotape recorder and its auxiliary equipment is emerging as an essential item. Facilities for the development of instructional materials will be needed by the institution preparing teachers in a preservice program. It should be noted that all of the equipment and facilities will have a potential for research,* for in-service education, and for graduate programs.

E. School-College Relations

The revised content will place new demands on the relationships between

* Schueler, Herbert, and Lesser, Gerald S. Teacher Education and the New Media. Washington, D.C.: American Association of Colleges for Teacher Education, 1967. 122 pp.

schools and colleges.** The criteria and procedures for selecting cooperating teachers and the assignment of teacher education students will need to be restudied. The school and its professional staff will need to assist in the development of recorded instructional materials. Cooperative planning should receive new emphasis.

2. CONCLUSIONS

The problems that have been identified do not appear to be insurmountable, nor should they distort the basic purpose of the content revision — the improvement of teacher education. Improvement is dependent upon the quality of the content of the preservice component of the program of teacher education.

At some time in the history of teacher education, a dichotomy between talk about schools and teaching and about practice developed. The talk about teaching and schools has for a number of years been incorrectly considered theory. The information about education has a certain value, but an estimate of its value is dependent upon a "for what" question.

The notion of practice is a far too limited concept for the development of a high level teaching competence. If it were actually possible to assign all prospective teachers to outstanding experienced teachers, the superimposed effect of imitation or mimicking would reduce the possibilities for individual professional growth. A further limitation within this dimension is the random nature of the possible experiences. There is a lack of design and control.

For too many years it has been taken for granted that the teacher education student will put together the talk about education which has been his primary on-campus professional experience and the realities of teaching which he discovers in his student teaching or internship. In bridging this gap, it has been assumed that he will establish for himself a sound conceptual model of what teaching is and should be. The recent research in teaching and work in theory indicates that this is an extremely difficult task, and that an assumption of this magnitude is more likely to be false than true. The essential premise offered here is that if the prospective teacher is provided in his professional experiences a variety of conceptual models about teaching and in his laboratory experiences an opportunity to test them, his chances of achieving the wherewithal and weaponry necessary to establish his own conceptual model of teaching are greater.

The basic questions which must be considered are these:

1. Is this the time to seek a change?
2. Does the proposed content outline offer or could it be adapted to give adequate direction?

** Smith, E. Brooks, and others, editors. Partnership in Teacher Education. Washington, D.C.: American Association of Colleges for Teacher Education, 1968. 308 pp.

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